

Technical Support Document and Responses to Comments

Final Rule on the San Joaquin Valley 2008 PM_{2.5} State Implementation Plan

Air Division
U.S. EPA Region 9
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For further information on this technical support document, please contact:

Frances Wicher
Office of Air Planning (AIR-2)
U.S. Environmental Protection Agency-Region 9
75 Hawthorne Street
San Francisco, California 94105
(415) 972-3957
wicher.frances@epa.gov

Documents referenced in this technical support document may be found in the docket for this rulemaking, docket no. EPA-R09-OAR-2010-0516, which may be found at www.regulations.gov. Documents that are not available in an electronic format may be found at the address above.

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Appendix B – SJVAPCD Rules

List of Acronyms

μ: micron (one millionth)
AB: California Assembly Bill
AERR: Air Emissions Report Rule, 40 CFR part 51, subpart A
ARB: California Air Resources Board (also CARB)
APCD: air pollution control district
AQMD: air quality management district
BAR: California Bureau of Automotive Repair
CAA: Federal Clean Air Act as amended in 1990
CARB: California Air Resources Board (also ARB)
CCAQS: Central California Air Quality Study
CCR: California Code of Regulations
CEFS: California Emissions Forecasting and Planning Inventory System
CEIDARS: California Emissions Inventory Development and Reporting System
CERR: Consolidated Emissions Reporting Rule, 40 CFR part 51, subpart A
CFR: Code of Federal Regulations
CMAQ: Congestion Mitigation and Air Quality funds
CMAQ: Community Multiscale Air Quality [model]
CMB: chemical mass balance
CO: carbon monoxide
CPM: condensable particulate matter
CRPAQS: California Regional Particulate Air Quality Study
District: San Joaquin Valley Air Pollution Control Agency
DPR: California Department of Pesticide Regulation
EC: elemental carbon
EPA: United States Environmental Protection Agency
FHWA: Federal Highway Administration
Fine particulate: PM_{2.5}
FMVCP: Federal motor vehicle control program
FR: Federal Register
FRM: Federal Reference Method
FTA: Federal Transit Administration
HNO₃: nitric acid
I/C: internal combustion
IMS95: 1995 Integrated Monitoring Study (in the San Joaquin Valley)
km: kilometer
m: meter
m³: cubic meter
mb: millibars
MCR: mid-course review
MFB: mean fractional bias
MFE: mean fractional error
MM5: a mesoscale model

List of Acronyms

MMPA: meteorological model performance analysis
MOZART: Model for Ozone And Related Chemical Tracers
MPO: metropolitan planning organization
MVEB: motor vehicle emissions budget
NAAQS: national ambient air quality standard
NH₃: ammonia
NH₄NO₃: ammonium nitrate
NO₂: nitrogen dioxide
NO_x: oxides of nitrogen
NSR: new source review
NYQ: not yet quantified
O₃: ozone
OC: organic carbon
OH: hydroxyl radical
OTAQ: EPA's Office of Transportation and Air Quality
PBL: planetary boundary layer
PM: particulate matter
PM₁₀: particulate matter with a diameter of 10 µm or less, includes PM_{2.5}
PM_{2.5}: particulate matter with a diameter of 2.5 µm or less
PMC: coarse particulate matter
PMF: positive matrix factorization
RACM: reasonably available control measures
RACT: reasonably available control technology
RFP: reasonable further progress
RMD: Receptor Modeling Documentation
RMPA: Regional Modeling Performance Analysis
RRF: relative response factor
RTP: regional transportation plan
SANDWICH: Sulfate, adjusted nitrate, derived water, inferred carbonaceous material balance approach
SC: South Coast
SIP: state implementation plan
SJV: San Joaquin Valley
SJVAPCD/SJVUAPCD: San Joaquin Valley (Unified) Air Pollution Control District
SMAT: Speciated Modeled Attainment Test
SO₂: sulfur dioxide
SOA: secondary organic aerosol
STN: Speciation Trends Network
SO_x: oxides of sulfur
TCM: transportation control measures
tpd: tons per day
TIP: transportation improvement program
TSD: technical support document

List of Acronyms

VMT: vehicle miles traveled
VOC: volatile organic compounds
WOE: weight of evidence

Technical Support Document and Response to Comments for the Final Rule on the San Joaquin Valley 2008 PM_{2.5} State Implementation Plan

I. Introduction and Background

This document provides supporting information and analysis for EPA's final rulemaking actions on the San Joaquin Valley Air Pollution Control District's *2008 PM_{2.5} Plan* (adopted April 30, 2008 and revised on June 17, 2010) and the related portions of the California Air Resources Board's *State Strategy for California's 2007 State Implementation Plan* (adopted with amendments on September 27, 2007, revised and updated on April 24, 2009 and April 28, 2011). EPA proposed action on these plans on November 30, 2010 (75 FR 74518) and July 13, 2011 (76 FR 41338). This TSD updates the technical support documents prepared in support of the November 30, 2010 and July 13, 2011 proposals.¹ In this TSD, we also provide our responses to the comments received on the two proposals.

A. The National Ambient Air Quality Standards for Fine Particulate (PM_{2.5})

1. The PM_{2.5} National Ambient Air Quality Standards

a. Level and Form of the Standard

On July 18, 1997, EPA revised the primary and secondary national ambient air quality standards (NAAQS) for particulate matter (PM) to add new annual and 24-hour standards for PM_{2.5}, particulate matter with a diameter of 2.5 microns or less. 62 FR 38652.² The annual standards are set at a level of 15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), as determined by the 3-year average of annual mean PM_{2.5} concentrations. The 24-hour standards were set at a level of 65 $\mu\text{g}/\text{m}^3$, as determined by the 3-year average of the 98th percentile of 24-hour concentrations. 40 CFR § 50.7.

¹ "Draft Technical Support Document for the Revised Proposed Action on the San Joaquin Valley 2008 PM_{2.5} Plan and the San Joaquin Valley Portions of the Revised 2007 State Strategy," Air Division, U.S. EPA, Region 9, November 8, 2010, referred to as the "2010 Proposal TSD" in this document. "Technical Support Document for the Revised Proposed Rulemaking Action on the San Joaquin Valley 2008 PM_{2.5} Plan and the San Joaquin Valley Portions of the Revised 2007 State Strategy," Air Division, U.S. EPA, Region 9, June 29, 2011, referred to as the "2011 Proposal TSD" in this document.

² The original annual and daily standards for particulate matter generally less than or equal to 10 micrometers in diameter (referred to as PM₁₀) were established in 1987. 52 FR 24663 (July 1, 1987). In the 1997 PM NAAQS revision, EPA also revised the standards for PM₁₀ but these revised PM₁₀ standards were later vacated by the courts and the 1987 PM₁₀ standards remained in effect. In the 2006 NAAQS revision, the 24-hour PM₁₀ standards were retained but the annual standards were revoked. See 71 FR 61144 (October 17, 2006). The San Joaquin Valley is designated as attainment for the PM₁₀ NAAQS. See 73 FR 66759 (November 12, 2009).

b. Health Effects

EPA established primary air quality standards for PM_{2.5} based on substantial evidence from numerous health studies demonstrating that serious health effects are associated with exposures to elevated levels of the pollutant. Epidemiological studies have shown statistically significant correlations between elevated PM_{2.5} levels and premature mortality. Other important health effects associated with PM_{2.5} exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), changes in lung function and increased respiratory symptoms, as well as new evidence for more subtle indicators of cardiovascular health. Individuals particularly sensitive to PM_{2.5} exposure include older adults, people with heart and lung disease, and children. *See, EPA, Air Quality Criteria for Particulate Matter*, No. EPA/600/P-99/002aF and EPA/600/P-99/002bF, October 2004.

Attainment of the 1997 PM_{2.5} standards is estimated to lead to reductions in health impacts, including tens of thousands fewer premature deaths each year, thousands fewer hospital admissions and emergency room visits each year, hundreds of thousands fewer absences from work and school, and hundreds of thousands fewer respiratory illnesses in children annually. *See* 72 FR 20586, 20587 (April 25, 2007).

c. Revisions to the 24-Hour PM_{2.5} Standards

In October 2006, EPA completed another review of the NAAQS for PM. With regard to the primary standards, the 24-hour PM_{2.5} standards are strengthened to a level of 35 μm^3 , based on the 3-year average of the 98th percentile of 24-hour concentrations. The annual standards remain unchanged. 71 FR 61144 (October 17, 2006). Attainment of the 2006 PM_{2.5} standards is estimated to lead to additional reductions in health impacts over the 1997 standard, including approximately 1,200 to 13,000 fewer premature deaths each year, 1,630 fewer hospital admissions and 1,200 fewer emergency room visits for asthma each year, 350,000 fewer absences from work and school, and 155,300 fewer respiratory illnesses in children annually. 72 FR 20586, 20587.

2. Implementing the PM_{2.5} NAAQS

a. Designations

The process for designating areas either attaining or not attaining following promulgation of a new or revised NAAQS is found in CAA section 107(d). Under this section, each state governor or tribal leader has an opportunity to recommend air quality designations, including the appropriate boundaries for areas, to EPA. Under CAA section 107, state and tribal recommendations are due within one year of promulgation of a new or revised NAAQS, and EPA has up to 3 years after the promulgation of a new or revised NAAQS to designate areas for that NAAQS. In the case of the 1997 PM_{2.5} standards, however, Congress amended section 107 to extend the schedule for EPA to initiate the designations process until three calendar years of air quality data, measured at Federal Reference Method monitors, were gathered. *See* section 6102(c)(1)(d) of the Transportation Equity Act for the 21st Century. EPA and state air quality agencies initiated the monitoring process for the PM_{2.5} NAAQS in 1999 and deployed all air quality monitors by January 2001. As a result, the designation process for the 1997 PM_{2.5} NAAQS did not begin until 2004.

By no later than 120 days prior to promulgating designations, EPA is required to notify states or tribes of any intended modifications to their boundaries that EPA deems necessary. States and tribes then have an opportunity to provide a demonstration as to why the proposed modifications suggested by EPA are inappropriate. CAA section 107(d)(1)(B)(ii). Whether or not a state or tribe provides a recommendation, EPA must promulgate the designation that it deems appropriate.

In April 2003, EPA requested that California submit its designation recommendations, based on ambient air quality data from 2001 to 2003, and supporting documentation by February 15, 2004. California submitted its recommendations on February 11, 2004. *See* Letter, Catherine Witherspoon, CARB, to Wayne Nastri, EPA-Region 9, February 11, 2004. On December 17, 2004, EPA issued final PM_{2.5} designations for areas violating the 1997 standards, including the San Joaquin Valley air basin. They were published in the **Federal Register** on January 5, 2005 (70 FR 944) and became effective on April 5, 2005. The designations are codified at 40 CFR part 81, subpart C.³

The designation of an area as nonattainment starts the process whereby a state or tribe must develop an implementation plan that includes, among other things, a demonstration showing how it will attain the ambient standards by the attainment dates required in the CAA. Under section 172(b) for PM_{2.5}, states have up to three years after final designations to submit their SIPs to EPA. The SIPs for the 1997 PM_{2.5} SIP were due on April 5, 2008, three years after the effective date of the designations.

b. PM_{2.5} Planning Requirements

In order to assist states in developing effective plans to address their PM_{2.5} nonattainment problem, EPA issued the Clean Air Fine Particulate Implementation Rule, also known as the PM_{2.5} implementation rule. 72 FR 20586 (April 25, 2007), codified at 40 CFR part 51, subpart Z. We proposed this rule on November 1, 2005 at 70 FR 65984. We issued this rule in accordance with the statutory requirements of the CAA set forth in subpart 1 of Part D of Title 1, *i.e.*, sections 171–179B.

The PM_{2.5} implementation rule covers most CAA requirements for PM_{2.5} state implementation plans. A list of these CAA requirements, the corresponding provision in the PM_{2.5} implementation rule and preamble are given in Table IA-1 below.

³ On November 13, 2009, EPA designated the SJV, along with other areas in the Country, as nonattainment for the 2006 24-hour PM_{2.5} standards. 74 FR 58688. California is now required to submit a plan demonstrating attainment of the 35 µg/m³ 24-hour standards by December 14, 2012. 74 FR 58688, 58689. The 2008 PM_{2.5} Plan we are reviewing in this TSD addresses only the 1997 24-hour PM_{2.5} standards of 65 µg/m³ and annual standards of 15 µg/m³.

Table IA-1 CAA Requirements for PM_{2.5} Attainment State Implementation Plans				
CAA Section	PM _{2.5} Implementation Rule		Description	TSD
	Rule	Preamble		
172(a)(2)(A)	§ 51.1 004	20600-20602	Attainment date and attainment date extensions	II.E.
172(b)	§ 51.1002(a)	20599-50600	SIP submittal date	I.B.3.
172(c)(1)	§ 51.1010	20609-20633	Reasonably available control measures (including reasonably available control technology)	II.D.
172(c)(1)	§ 51.1007(a)	20601-20602	Demonstration of expeditious attainment	II.F.
172(c)(2)	§ 51.1009	20633-20640	Reasonable further progress	II.H.
172(c)(3)	§ 51.1008	20647-20651	Emissions inventory	II.A.
172(c)(6)	§ 51.1007(b) § 51.1010(b)	20601-20602 20658-20660	Enforceable limitation limits, other control measures, means or techniques and schedules and timetables for compliance as necessary for attainment	II.D. & F.
172(c)(7)	§ 51.1002(b)	20600	CAA section 110(a)(2) requirements	N/A
172(c)(9)	§ 51.1012	20642-20645	Contingency measures for failure to attain or make reasonable further progress	II.J.
302(g)	§ 51.1002(c)	20589-20597	PM _{2.5} precursors to be evaluated for control	II.C.
172(c)(1)	§ 51.1007(b)	20629	Timing of emissions reductions for attainment	II.D. & F.
176(c)	§ 93.118(e)(4)	20645-20646	Motor vehicle emissions budgets	I.D.
172(c)(2) & (6)	§ 51.1011	20640	Mid-course review	II.I.
110(a)(2)(K)	§ 51.1007(a), § 51.112, and Appendix W	20605-20609	Air Quality Modeling	II.F.

In June 2007, a petition to the EPA Administrator was filed on behalf of several public health and environmental groups requesting reconsideration of four provisions in the PM_{2.5} implementation rule. *See* Earthjustice, “Petition for Reconsideration in the Matter of the Final Clean Air Fine Particulate Implementation Rule, EPA Docket No. OAR-2003-0062,” June 25, 2007. These provisions are:

1. Presuming that compliance with the (now remanded) Clean Air Interstate Rule satisfies the NO_x and SO₂ RACT requirements for electric generating units (EGUs). 72 FR 20586, 20623-20628. EPA granted the petition for this provision on April 25, 2011. Letter, Gina McCarthy, Assistant Administrator for Air and Radiation, EPA, to David Baron and Paul Cort, Earthjustice, April 25, 2011.
2. Allowing states to defer establishing emissions limits for condensable PM until January 1, 2011. 72 FR 20586, 20652 (codified at 40 CFR § 51.1002(c)). EPA denied the petition for this provision on April 25, 2011 because the deferral period had already lapsed.
3. Revising the criteria for analyzing the economic feasibility of RACT from a presumption that a given source must bear a cost similar to other sources to a consideration of whether the cost of a measure is reasonable for the regulated entity to bear, in light of benefits. 72 FR 20586, 20619-20620. EPA granted the petition for this provision on April 25, 2011.
4. Allowing states to use emissions reductions from outside of the nonattainment area to demonstration RFP. 72 FR 20586, 20636. EPA granted the petition for this provision on May 13, 2010. Letter, Gina McCarthy, Assistant Administrator for Air and Radiation, EPA, to David Baron and Paul Cort, Earthjustice, May 13, 2010.

The disputed provisions of the PM_{2.5} implementation rule are, for the most part, not relevant to today’s action because California did not rely on them in developing the PM_{2.5} plan for the San Joaquin Valley. We address each of these provisions later in this TSD: the first three in section II.D. (RACT/RACM) and the fourth in section II.H. (RFP).

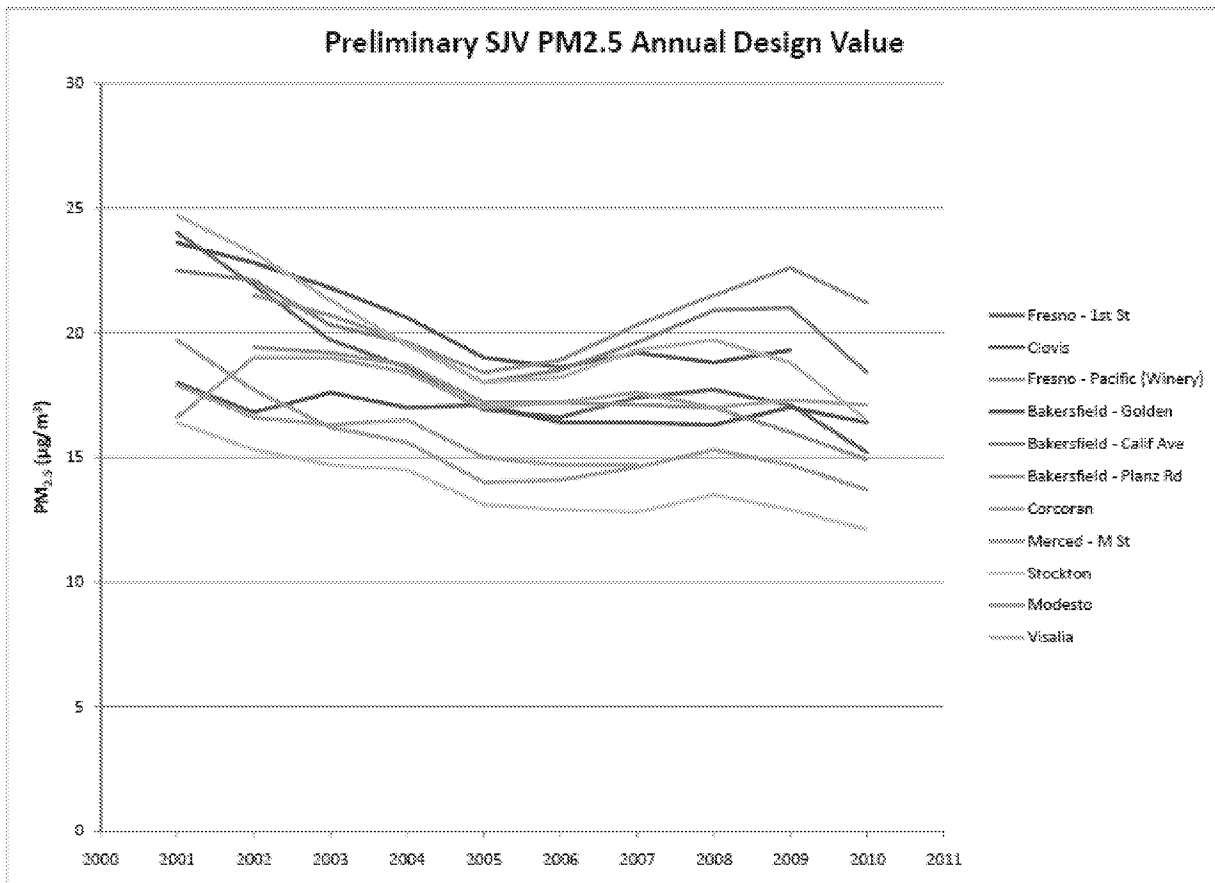
B. PM_{2.5} Air Quality in the San Joaquin Valley

The San Joaquin Valley PM_{2.5} nonattainment area is located in the southern part of California’s Central Valley. It is home to almost 4 million people and is the nation’s leading agricultural area. Stretching over 250 miles from north to south and averaging 80 miles wide, it is partially enclosed by the Coast Mountain range to the west, the Tehachapi Mountains to the south, and the Sierra Nevada range to the east. In total, the SJV PM_{2.5} nonattainment area encompasses over 23,000 square miles and includes all or part of eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Tulare, Kings, and the valley portion of Kern. *See* Figure IB-3. The local air district is the San Joaquin Valley (Unified) Air Pollution Control District (SJVAPCD, SJVUAPCD, or District).

1. PM_{2.5} Levels in the San Joaquin Valley

Annual and 24-hour PM_{2.5} levels in the urban Bakersfield area in the southern SJV are the highest recorded in the United States at 21.2 µg/m³ and 65 µg/m³ for the 2008-2010 period.⁴ Since comprehensive monitoring began for PM_{2.5} in the SJV in the late 1990, the area has seen a significant decline in ambient levels, especially in the 2000-2005 time period. *See* Figures IB-1 and IB-2. Between 2005 and 2008, PM_{2.5} concentrations increased at many monitoring sites in the Valley but began to decline again in the 2008-2010 period. Figure IB-3 is a map of the current monitoring system in the SJV.

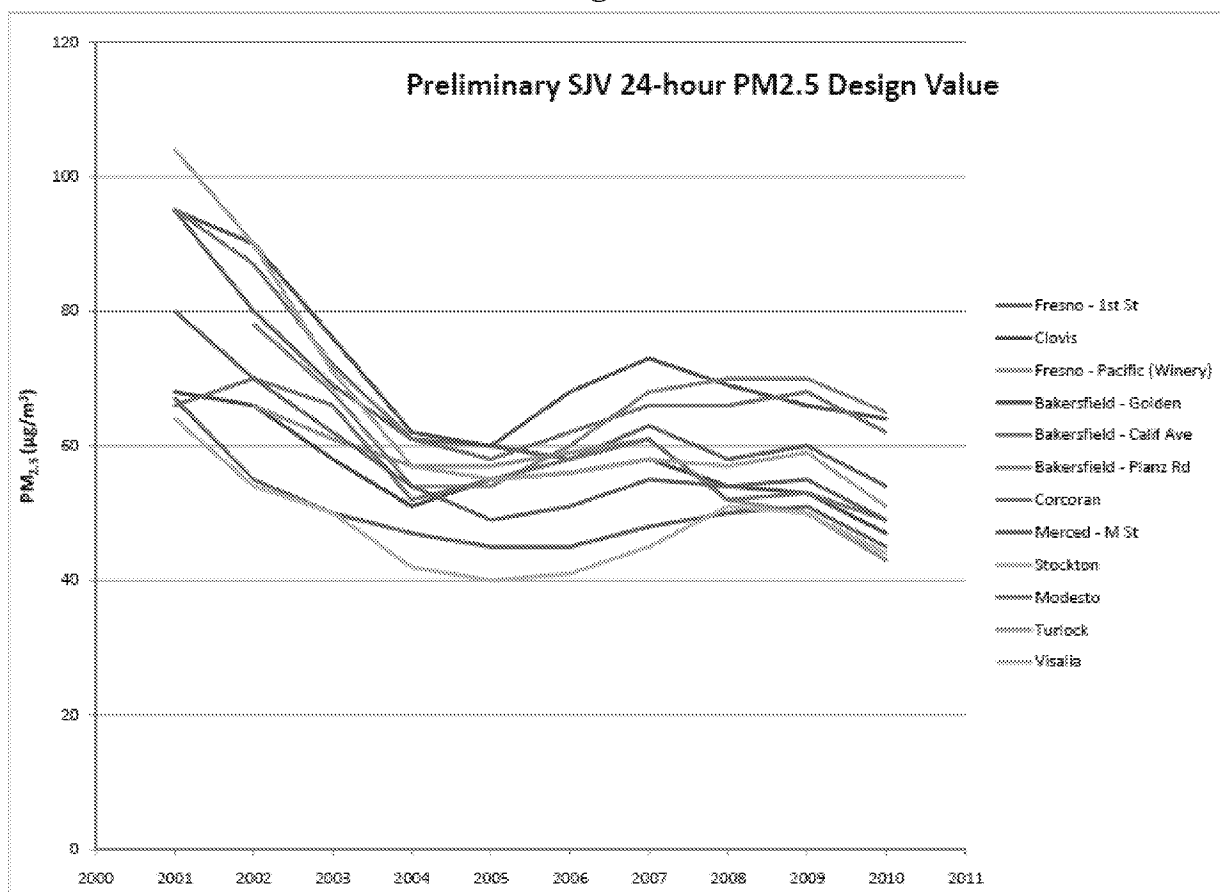
Figure IB-1



Source: EPA's Air Quality Systems Database, June 2011. The level of 1997 annual PM_{2.5} NAAQS is 15 µg/m³

⁴ See EPA, Air Quality Subsystem, Design Value Report, June 1, 2011. These values are the highest design values in the SJV. A design value is an ambient concentration calculated using a specific methodology from monitored air quality data and is used to compare an area's air quality to a NAAQS. The methodologies for calculating design values for the annual and 24-hour PM_{2.5} NAAQS are found in 40 CFR 50, Appendix N, Sections 1(c)(1) and 1(c)(2), respectively.

Figure IB-2



Source: EPA's Air Quality Systems Database, June 2011. The level of 1997 24-hour PM_{2.5} NAAQS is 65 µg/m³.

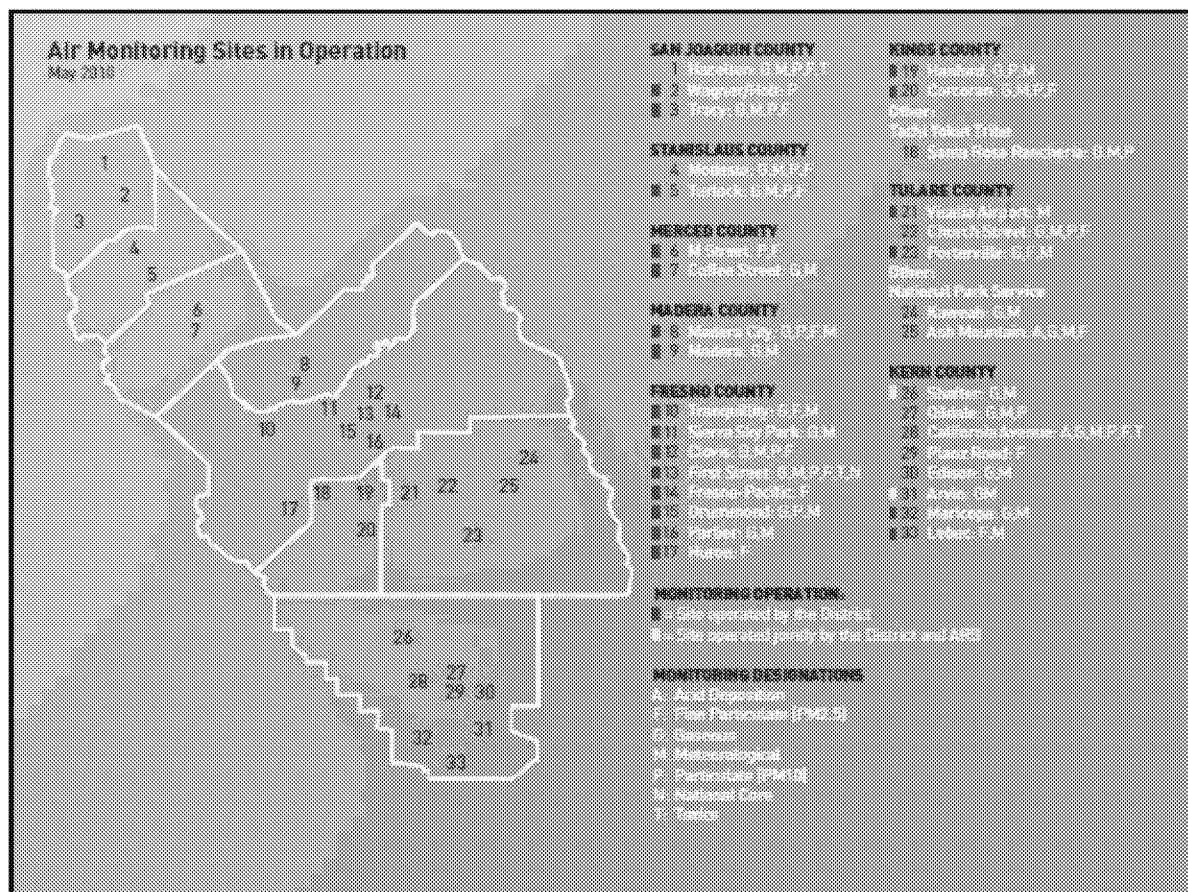
2. Seasonality and Chemical Composition of PM_{2.5} in the San Joaquin Valley

PM_{2.5} in the air is a complex mixture of components. Common components include: nitrate (NO₃); sulfate (SO₄); ammonium; elemental carbon; a great variety of organic compounds; and inorganic material (including metals, dust, sea salt, and other trace elements) generally referred to as crustal material, although it may contain material from other sources. Primary particles are emitted directly into the air as a solid or liquid particle (e.g., elemental carbon from diesel engines or fire activities, or condensable organic particles from gasoline engines). Secondary particles (e.g., nitrate and sulfate) form in the atmosphere as a result of chemical reactions between precursor pollutants such as NO_x, SO₂, VOC, and ammonia. Understanding the compounds that make up an area's PM_{2.5} problem is necessary in order to develop control strategies that are effective for attaining the NAAQS. 72 FR 20586, 20589.

In the SJV, the levels and nature of PM_{2.5} in the ambient air vary by season. *See* Figures IB-4 to IB-7; *see also* SJV 2008 PM_{2.5} Plan Progress Report, Figure A-7. Higher PM_{2.5} concentrations occur during the winter, between late November and February, when ambient PM_{2.5} is dominated by ammonium nitrate, formed from NO_x and ammonia emissions, and directly-emitted particulates, such as wood smoke. During the winter, the SJV experiences extended periods of stagnant weather with cold, damp, foggy conditions; conditions that are

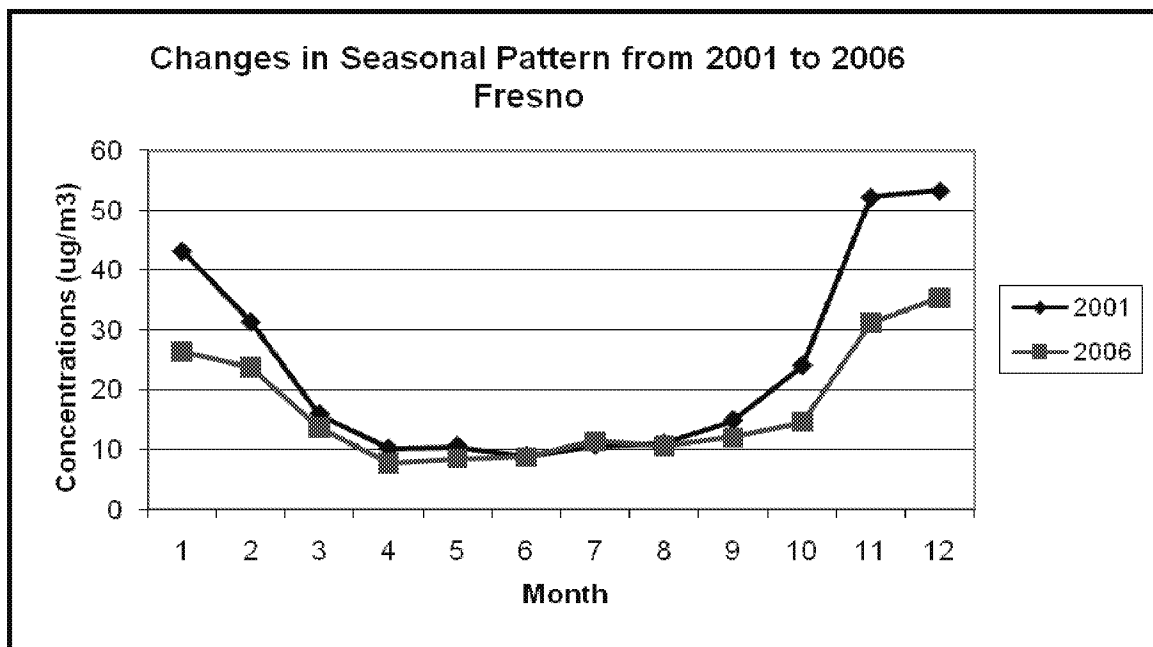
conductive to the formation of secondary ammonium nitrate particulates and encourage wood burning. During the summer, PM_{2.5} levels generally remain below 15 µg/m³, the level of the annual standards

Figure IB-3 – Ambient Monitoring Locations In the San Joaquin Valley



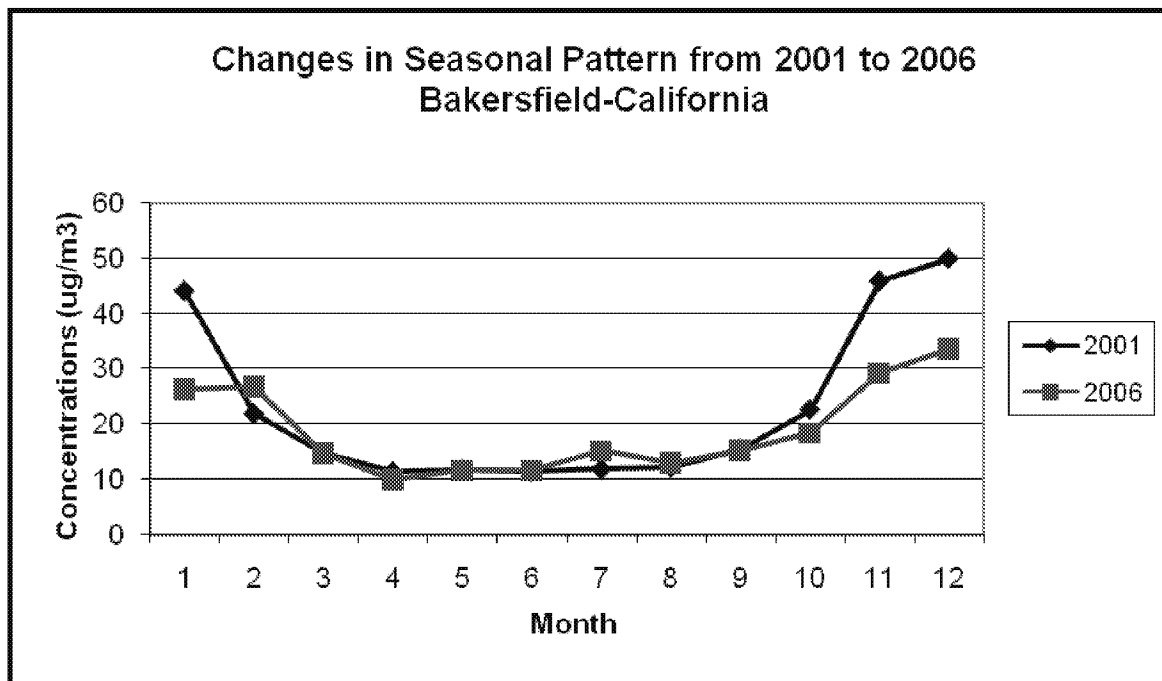
Source: SJVAPCD, *Annual Report to the Community, 2010*, p. 35.

Figures IB-4



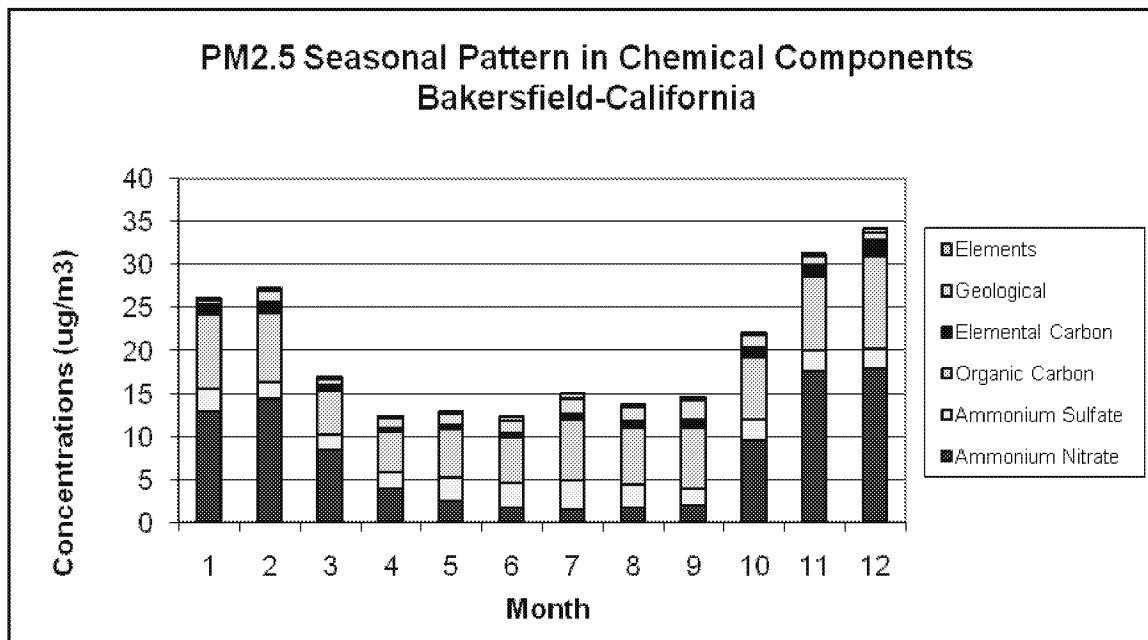
Source: 2008 PM_{2.5} Plan, Appendix H, Figure H-5.

Figure IB-5



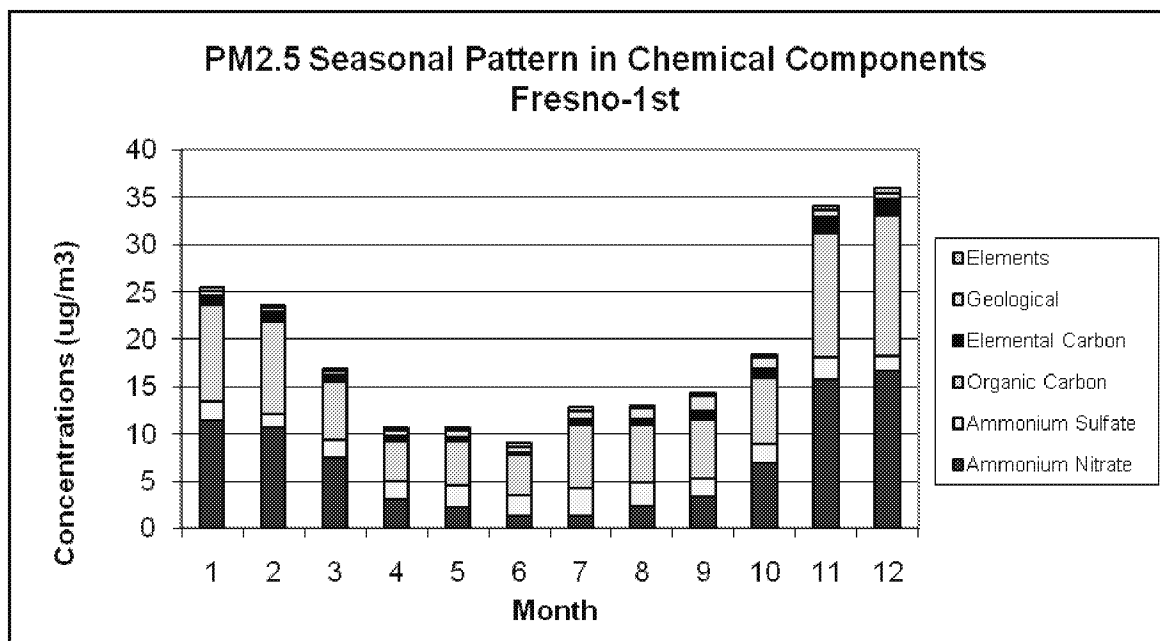
Source: 2008 PM_{2.5} Plan, Appendix H, Figure H-4.

Figure IB-7



Source: 2008 PM_{2.5} Plan, Appendix H, Figure H-6.

Figure IB-8



Source: 2008 PM_{2.5} Plan, Appendix H, Figure H-7.

C. California's Submittals Constituting the SJV PM_{2.5} State Implementation Plan

Six submittals or parts of submittals comprise the SJV PM_{2.5} attainment state implementation plan. We will refer to these five submittals or parts of submittals collectively as the SJV PM_{2.5} [attainment] SIP:

1. *2008 PM_{2.5} Plan*, adopted on April 30, 2008 by the SJVUAPCD and on May 22, 2008 by CARB, submitted with the adopting resolutions and other supporting documentation by CARB on June 30, 2008. *See* San Joaquin Valley Unified Air Pollution Control District Governing Board Resolution: In the Matter of Adopting the San Joaquin Valley Unified Air Pollution Control District 2008 PM_{2.5} Plan, April 30, 2008; CARB Resolution No. 08-28, May 22, 2008; and letter, James N. Goldstene, Executive Officer, CARB to Wayne Nastri, Regional Administrator, EPA Region 9, June 30, 2008 with enclosures. This document will be referenced in this TSD and the **Federal Register** notice as the 2008 PM_{2.5} Plan, the SJV 2008 PM_{2.5} Plan, or simply the Plan.
2. *Proposed State Strategy for California's 2007 State Implementation Plan*, as amended and adopted on September 27, 2007 by CARB, submitted with the adopting resolution and other supporting documentation by CARB on November 16, 2007. *See* CARB Resolution No. 07-28, September 27, 2007 and letter, James N. Goldstene, Executive Officer, CARB, to Wayne Nastri, Regional Administrator, EPA Region 9, November 16, 2007, with enclosures. This document will be referenced in this TSD and the **Federal Register** notice as the 2007 State Strategy.
3. *Status Report on the State Strategy for California's 2007 State Implementation Plan (SIP) and Proposed Revisions to the SIP Reflecting Implementation of the 2007 State Strategy*, adopted on April 24, 2009 by CARB, submitted with the adopting resolution and other supporting documentation by CARB on August 12, 2009.⁵ *See* CARB Resolution No. 09-34, April 24, 2009 and letter, James N. Goldstene, Executive Officer, CARB, to Laura Yoshii, Acting Regional Administrator, EPA Region 9, August 12, 2009 with enclosures. This document will be referenced in this TSD and the **Federal Register** notice as the 2009 State Strategy Status Report.
4. *2008 PM_{2.5} Plan Amendment to Extend the Rule 4905 Amendment Schedule*, adopted on June 17, 2010 by the SJVUAPCD, submitted with adopting resolution and other supporting documentation by CARB on September 15, 2010. *See* SJVUAPCD Governing Board Resolution No. 10-06-18, June 17, 2010 and letter, James N. Goldstene, Executive Officer, CARB to Jared Blumenfeld, Regional Administrator, EPA Region 9, September 15, 2010, with enclosures.
5. *Progress Report on Implementation of PM_{2.5} State Implementation Plans (SIP) for the South Coast and San Joaquin Valley Air Basins and Proposed SIP Revisions*, adopted on April 28, 2011 by CARB, submitted with the adopting resolution and other supporting

⁵ Only pages 11-27 of the 2009 State Strategy Status Report are submitted as a SIP revision. The balance of the report is for informational purposes only. *See* Attachment A to the CARB Resolution, No. 09-34.

documentation by CARB on May 18, 2011.⁶ See CARB Resolution No. 11-24, April 28, 2011 and letter, James N. Goldstene, Executive Officer, CARB, to Jared Blumenfeld, Regional Administrator, EPA Region 9, May 18, 2011 with enclosures. This document will be referenced in this TSD and the **Federal Register** notice as the 2011 Progress Report.

6. *8-Hour Ozone State Implementation Plan Revisions and Technical Revisions to the PM_{2.5} State Implementation Plan Transportation Conformity Budgets for the South Coast and San Joaquin Valley Air Basins*, adopted on July 21, 2011 by CARB and submitted with adopting resolution and other supporting information by CARB on July 29, 2011. See CARB Resolution No. 11-22, July 21, 2011 and letter, James N. Goldstene, Executive Officer, CARB to Jared Blumenfeld, Regional Administrator, EPA Region 9, July 29, 2011, with enclosures.⁷ This document will be referenced in this TSD and the **Federal Register** notice as the 2011 Ozone SIP Revisions.

Future references in this TSD and the **Federal Register** notice to the 2007 State Strategy and the 2008 PM_{2.5} Plan will be to the Strategy as revised in 2009 and 2011 and the Plan as revised in 2010 and 2011, respectively, unless explicitly stated otherwise.

In addition to these plan submittals, the District and CARB have provided information on the implementation status of the SJV 2008 PM_{2.5} SIP's control strategy. CARB also provided supplemental documentation of the air quality modeling and further analysis of the effectiveness of VOC controls for reducing PM_{2.5} levels in the Valley as well as further information supporting the 2011 Progress Report. This additional information is

1. Letter, John DaMassa, Chief Modeling and Meteorology Branch, CARB to Frances Wicher, Office of Air Planning, EPA Region 9, January 28, 2011 providing supplemental air quality modeling documentation (CARB modeling supplement).
2. Letter, James N. Goldstene, Executive Officer, CARB, to Frances Wicher, Office of Air Planning, EPA Region 9, January 28, 2011, Attachment 4, "Air Resources Board comments on U.S. EPA's November 30, 2010 proposal that VOC be considered a significant PM_{2.5} Precursor for the San Joaquin Valley 2008 PM_{2.5} State Implementation Plan (SIP)." (CARB VOC supplement)
3. SJVAPCD, *2008 PM_{2.5} Plan Progress Report*, Draft March 2011 (SJV PM_{2.5} Progress Report).

⁶ Only Appendices B, C and D of the 2011 Progress Report are submitted as a SIP revision. The balance of the report is for informational purposes only. See May 18, 2011 Goldstene Letter.

⁷ Only Appendix A of the 2011 Ozone SIP Revisions is submitted as a SIP revision; the balance of the report is for informational purposes only. See Attachment A, CARB Resolution No. 11-22. Among other things, this SIP revisions includes a revised RFP demonstration for the 1997 8-hour ozone NAAQS and revised 8-hour ozone motor vehicle emissions budgets for transportation conformity. We are only acting on the revisions to the PM_{2.5} SIP transportation budgets here. We will act on the ozone-related provisions of this SIP submittal as part of our final action on the SJV 2008 8-Hour Ozone SIP. We proposed to approve these provisions on 76 FR 57846 (September 16, 2011).

4. Letter, Lynn Terry, Deputy Executive Office, CARB, to Elizabeth Adams, Deputy Director, Air Division, EPA–Region 9, May 18, 2011. (CARB Progress Report supplement).

Finally, both CARB and the District have adopted and submitted numerous rules that reduce emissions in the San Joaquin Valley and contribute to progress in meeting the PM_{2.5} NAAQS in the area. *See* Appendices A and B of this TSD.

D. Public Notice and Hearing Requirements for and Completeness of SIP Submittals

1. Public Notice and Hearing Requirements for SIP Submittals

CAA sections 110(a) and (l) require a state to provide reasonable public notice and hearing prior to the adoption and submittal of a SIP or SIP revision. To meet this requirement, every SIP submittal should include evidence that adequate public notice was given and a public hearing was held consistent with EPA’s implementing regulations in 40 CFR § 51.102.

Both the District and CARB have satisfied applicable statutory and regulatory requirements for reasonable public notice and hearing prior to adoption and submittal of the 2008 PM_{2.5} Plan. The District conducted public workshops, provided public comment periods, and held a public hearing prior to the adoption of the Plan on April 30, 2008. *See* SJVUAPCD Governing Board Resolution, page 3. CARB also provide the required public notice and opportunity for public comment prior to its May 22, 2008 public hearing on the Plan. *See* CARB, Notice of Public Meeting to Consider the Approval of the SJV 2008 PM_{2.5} SIP, April 25, 2008. The District also provided the required public notice and hearing on the 2010 revision to the Plan. *See* SJVUAPCD Governing Board Resolution No. 10-06-18, June 17, 2010.

CARB conducted public workshops, provided public comment periods, and held a public hearing prior to its adoption of the 2007 State Strategy on September 27, 2007. *See* CARB, Notice of Public Meeting to Consider Approval of the Proposed State Strategy for California’s State Implementation Plan (SIP) for the Federal 8-Hour Ozone and PM_{2.5} Standards, May 7, 2007 and CARB Resolution No. 07-28, September 27, 2007.

CARB provide the required public notice, opportunity for public comment, and public hearing prior to its April 24, 2009 adoption of revisions to the Strategy. *See* CARB, Notice of Public Hearing to Consider a Status Report on the State Strategy for California’s 2007 State Implementation Plan and Consider Approval of a Proposed Revision to the State Implementation Plan Reflecting Implementation of the 2007 State Strategy, March 24, 2009 and CARB Resolution No. 09-34, April 24, 2009.

CARB provide the required public notice, opportunity for public comment, and public hearing prior to its April 28, 2011 adoption of the 2011 Progress Report and its July 21, 2011 adoption of its 2011 Ozone SIP Revisions. *See* CARB, Notice of Public Hearing to Consider the Approval of a Progress Report and Proposed State Implementation Plan Revisions for PM_{2.5}, March 29, 2011 and CARB Resolution No. 11-24, April 28, 2011 and CARB, Notice of Public Hearing to Consider a Status Report on the State Strategy for California’s 2007 State

Implementation Plan and Consider Approval of Proposed Revisions for the 8-Hour Ozone and Minor Technical Revisions to the PM_{2.5} SIP Transportation Conformity Budgets,” June 20, 2011.

2. Completeness Determinations on SIP Submittals

CAA section 110(k)(1)(B) requires EPA to determine whether a SIP submittal is complete within 60 days of receipt. This section also provides that any plan that we have not affirmatively determined to be complete or incomplete will become complete by operation of law six months after the day of submittal. A completeness review allows us to determine if the submittal includes all the necessary items and information we need to act on it.

We make completeness determinations using criteria we have established in 40 CFR part 51, Appendix V. These criteria fall into two categories: administrative information and technical support information. The administrative information provides documentation that the state has followed basic administrative procedures during the SIP-adoption process and thus we have a legally-adopted SIP revision in front of us. The technical support information provides us the information we need to determine the impact of the proposed revision on attainment and maintenance of the air quality standards.

We notify a state of our completeness determination by letter unless the submittal became complete by operation of law. A finding of completeness does not approve the submittal as part of the SIP nor does it indicate that the submittal is approvable. It does start the 12-month clock we have to act on the SIP submittal. *See* CAA section 110(k)(2).

The June 30, 2008 submittal of the 2008 PM_{2.5} Plan went complete by operation of law on December 30, 2008. We found the 2010 revision to the Plan complete on September 23, 2010. *See* letter, Deborah Jordan, EPA Region 9 to James Goldstene, CARB, September 23, 2010. The November 16, 2007 submittal of the 2007 State Strategy and the August 12, 2009 submittal of the 2009 revisions to the Strategy went complete by operation of law on May 16, 2008 and February 12, 2010, respectively. We found the May 18, 2011 submittal complete on June 13, 2011. *See* letter, Deborah Jordan, EPA Region 9 to James Goldstene, CARB, June 13, 2011. We found the 2011 Ozone SIP Revisions complete on August 23, 2011. *See* letter, Deborah Jordan, EPA Region 9 to James Goldstene, CARB, August 23, 2011.

II. Evaluation of the San Joaquin Valley 2008 PM_{2.5} SIP

A. Emissions Inventories

1. Requirements for Emissions Inventories

CAA section 172(c)(3) requires a state to submit a plan provision that includes a “comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant.” Pursuant to this section, the PM_{2.5} implementation rule requires a state to submit, within three years of the designation of one of its areas as nonattainment, statewide emissions inventories of direct PM_{2.5} and PM_{2.5} precursors. These inventories should meet the data requirements of EPA’s Consolidated Emissions Reporting Rule (CERR, codified at 40 CFR part 51 subpart A). 40 CFR § 51.1008(a)(1).⁸ Direct PM_{2.5} includes condensable PM. 40 CFR § 51.1000. PM_{2.5} precursors are NO_x, SO₂, VOC, and ammonia. *Id.* The state must report inventories for each, even if it has determined that control of any of these precursors is not necessary for attainment. *Id.* and 72 FR 20586, 20648.

The PM_{2.5} implementation rule also requires a state to submit a baseline emissions inventory as part of the attainment and RFP demonstrations in its PM_{2.5} attainment plan. The base year for this inventory should be calendar year 2002 or other suitable year for areas initially designated nonattainment for the PM_{2.5} in 2004-2005. 40 CFR § 51.1008(b). The baseline inventory should be appropriate for the geographical area addressed by the PM_{2.5} attainment plan and consistent with applicable EPA guidance. 72 FR 20586, 20648. A state is also required to submit any additional emissions inventory information needed to support its attainment and RFP demonstrations. 72 FR 20586, 20648 and 40 CFR § 51.1008(a)(2).

EPA has issued the “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/R-05-001, November 2005 (available at www.epa.gov/ttn/chief/eidocs/eignid/index.html). EPA developed this guidance document to complement the CERR and to provide specific guidance on how to develop emissions inventories for 8-hour ozone, PM_{2.5}, and regional haze SIPs.

The emissions inventories required under the PM_{2.5} implementation rule (as opposed to the CERR) are SIP provisions that must be approved by EPA under CAA section 110(k) and are subject to public hearing requirements pursuant to sections 110(a)(2) and (l). A state should include in its SIP submittal documentation explaining how the emissions data were calculated. In estimating mobile source emissions, a state should use the latest emissions models and planning assumptions available at the time the SIP is developed. 72 FR 20586, 20647. For California, the latest emissions model means the then most recently EPA approved version of EMFAC. Currently this is EMFAC2007. *See* 73 FR 3464 (January 18, 2008).

⁸ In late 2008, EPA promulgated the Air Emissions Reporting Rule (AERR) at 73 FR 76539 (December 17, 2008). The AERR updated the CERR reporting requirements by consolidating and harmonizing new emissions reporting requirements with pre-existing sets of reporting requirements under the NO_x SIP Call (which does not apply to California). Because this AERR was not finalized until after the submittal of the SJV PM_{2.5} Plan, its data requirements, in that they differ from the CERR requirements, do not apply to the Plan.

2. Emissions Inventories in the SJV PM_{2.5} SIP

Note: We discuss CARB's statewide inventory to provide background to our evaluation of the emissions inventories in the SJV 2008 PM_{2.5} Plan. We are not acting on the statewide inventory here.

CARB submitted statewide inventories for direct PM_{2.5} and PM_{2.5} precursors (except for ammonia) as part of the 2007 State Strategy. *See* Appendix A for the emissions inventory output tables and Appendix F for documentation of the emissions inventory. Inventories are provided for the Strategy's base year of 2002 and baseline years of 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2017, 2018, 2020, and 2023.⁹ These statewide emissions inventories are assembled and maintained by CARB in the California Emissions Inventory Development and Reporting System (CEIDARS) and the California Emission Forecasting and Planning Inventory System (CEFS) databases. Both systems are described in Appendix F.

The inventories in Appendix A are summer season planning inventories on which the 2007 State Strategy is based. Baseline inventories incorporate reductions from control measures adopted prior to December 2006. 2008 PM_{2.5} Plan, p. B-1 and 2007 State Strategy, Appendix A, p. 1. Specific adjustments for State and District rules adopted in the 2004 to 2006 time period, as well as adjustments to among other things, heavy duty truck VMT in 2005 and pesticide emissions, are described in the introductory section to Appendix A and can also be found in Appendix B to the December 2007 draft of the SJV 2008 PM_{2.5} Plan.

The planning inventories for direct PM_{2.5} and all PM_{2.5} precursors (including ammonia) for the SJV PM_{2.5} nonattainment area together with additional documentation for the inventories are found in Appendix B of the SJV 2008 PM_{2.5} Plan. Both average winter day and average annual day inventories are provided for the year 2005 (the base year for the attainment and RFP demonstrations) and each year from 2009 to 2014. A winter inventory is provided because the majority of high PM_{2.5} days in the SJV occur during the winter months between November and February. 2008 PM_{2.5} Plan, Figures H-4 and H-5. The inventories use EMFAC2007 for estimating on-road motor vehicle emissions. 2008 PM_{2.5} Plan, p. B-1. These inventories provide the basis for the control measure analysis and the RFP and attainment demonstrations.

As a starting point for the 2008 PM_{2.5} Plan's inventories, the District used CARB's 2002 inventory. 2008 PM_{2.5} Plan, p. B-1. The 2002 inventory was projected to 2005 and future years using CEFSv 1.06. 2008 PM_{2.5} Plan, p. B-1.

All inventories include emissions from point, area, on-road, and non-road sources. None specifically show emissions from non-anthropogenic sources (that is, natural sources) although inventories developed for input into the air quality modeling do include such sources. 2008 PM_{2.5} Plan, p. G-3.

A summary of the planning inventories for the Plan's base year of 2005 and baseline years of, 2009, 2012 and 2014 is provided in Table A-1 below.

⁹ The 2007 State Strategy addresses both 8-hour ozone standard and the PM_{2.5} standards; therefore, baseline inventories are given not only for years of importance for PM_{2.5} plans but also ones of importance for 8-hour ozone plans.

3. Proposed Actions on Emissions Inventory

In our November 2010 and July 2011 proposed actions on the SJV 2008 PM_{2.5} SIP, we proposed to find that the 2002 emissions inventory in the 2007 State Strategy and the 2008 PM_{2.5} Plan met the CAA section 172(c)(3) requirement for the State to submit a plan provision that includes a comprehensive, accurate, current, inventory of actual emissions from all sources of the relevant pollutant. We also proposed to find that the baseline inventories in the SJV 2008 PM_{2.5} Plan provided an adequate basis for the reasonably available control measure, reasonable further progress and attainment demonstrations in the Plan. *See* 2010 Proposal TSD, section II.A.; 75 FR 74518, 74522; 2011 Proposal TSD, section II.A.; and 76 FR 41338, 41342.

4. Evaluation and Conclusions

The emissions inventories were made available to the public for comment at the same time as the draft 2007 State Strategy and 2008 PM_{2.5} Plan and were subject to public hearing as part of final version of the Strategy and Plan. *See* CARB Resolution No. 07-28, p. 3 and SJVUAPCD Governing Board Resolution, p. 3.

The SJV PM_{2.5} SIP uses a 2005 base year inventory. When considered together with the inventory documentation in Appendix F of the State Strategy and the inventory documentation in Appendix B and air quality modeling documentation in Appendices E-G of the Plan, it contains all the elements required by EPA's emissions inventory guidance.

The inventories in the SJV PM_{2.5} SIP are based on the most current and accurate information available to the State and District at the time the Plan was developed and submitted (including using the latest EPA-approved version of California's mobile source emissions model, EMFAC2007), address comprehensively all source categories in the SJV, and meet the applicable requirements of EPA's inventory guidance.

For these reasons, EPA is approving the 2005 base year emissions inventory in the SJV PM_{2.5} SIP as meeting the requirements of CAA section 172(c)(3) and 40 CFR § 51.1008(a)(1). We also find that the baseline inventories in the SJV PM_{2.5} SIP provide an adequate basis for the reasonably available control measure, reasonable further progress and attainment demonstrations.

We received a number of comments on our proposed approval of the emissions inventory. We have reviewed these comment and provided responses to them. *See* section III.B. of this TSD. No issues raised in these comments changed our finding that the emissions inventories in the SJV 2008 PM_{2.5} Plan are consistent with the applicable requirements of the CAA and EPA guidance.

2011 Revisions to the Plan's Base Year and Projected Baseline Inventories

From late 2007 until mid-2009, California experienced an economic recession that greatly reduced and continues to affect the level of activity in the State's construction and goods movement sectors. 2011 Progress Report, Appendix E. As a result, current and projected emission levels from these categories are now substantially lower than were projected in 2008 SJV PM_{2.5} Plan. At this time, EPA will reflect these recession impacts (in combination with the technical corrections to the inventory discussed below) as a line-item adjustments to the baseline inventories.

These recession-caused decreases in emissions do not affect either the Plan's modeling year (2000) or base year (2005) inventories and thus do not change the carrying capacity estimates in the Plan (that is, they do not affect the target level of overall emissions needed to demonstrate attainment) or the starting point for the reasonable further progress demonstration. Their principal effect is to reduce the reductions needed from the Plan's control strategy to demonstrate RFP and attainment.

CARB also made technical changes to the inventory for diesel trucks and buses as part of its December 2010 rulemaking amending its In-Use On-Road Truck and Bus Rule. These included updates and revisions to:

- regional allocation factors
- out-of-state vehicle miles traveled estimates
- new vehicle inventory categories
- lifetime mileage assumptions

See CARB, Staff Report: Initial State of Reasons for Proposed Rulemaking, Proposed Amendments to the Truck and Bus Regulations, The Drayage Truck Regulation and the Tractor-Trailer Greenhouse Gas Regulation, October 2010, p. 17.

CARB also comprehensively updated and revised the inventory for off-road equipment as part its December 2010 rulemaking amending the In-Use Off-Road Equipment Rule. These included updates and revisions to:

- equipment population
- hours of use
- load factors
- future equipment sales and activity

See CARB, Staff Report: Initial State of Reasons for Proposed Rulemaking, Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements, October 2010, pp. 16-17.

CARB estimates that these technical revisions reduce the total 2005 base year NO_x and PM_{2.5} inventory by approximately 6 percent of the NO_x and 5 percent, respectively. CARB Progress Report supplement, Attachment 1. These change are too small to affect the overall accuracy of the inventory given the normal and unavoidable uncertainties in emissions inventories.

We have also considered the potential effects of the revisions to the truck, bus, and off-road equipment emissions inventory categories on the approvability of the attainment and RFP demonstrations in the Plan and concluded they do not adversely affect them. *See* sections II.B.5. and II.H. of this TSD. We note that the State and District are currently working on a revisions to the SJV PM_{2.5} SIP to address the 2006 24-hour PM_{2.5} standard. These revisions are due to EPA in December 2012 and will, as required by CAA section 172(c)(3) include the latest updates to the emissions inventories.

Table A-1
Emissions Inventory Summary for the San Joaquin Valley PM_{2.5} Nonattainment Area
(tons per day)

	Annual Average Day				Winter Average Day			
	2005	2009	2012	2014	2005	2009	2012	2014
Direct PM _{2.5}								
Stationary Sources	13.3	13.8	14.2	14.4	12.8	13.3	13.7	14.0
Area Sources	51.5	46.8	45.8	45.2	54.6	51.2	49.2	47.9
On-Road Mobile Sources	12.1	11.3	9.9	8.9	12.2	11.4	10.0	9.0
Off-Road Mobile Sources	9.0	7.9	7.2	6.6	8.1	7.0	6.3	5.7
Total	86.0	79.8	77.0	75.0	87.6	82.9	79.1	76.6
Nitrogen Oxides								
Stationary Sources	80.1	62.7	58.7	56.5	71.9	58.5	56.2	55.0
Area Sources	13.5	11.0	10.8	10.7	18.2	16.3	15.9	15.7
On-Road Mobile Sources	327.9	297.4	243.8	206.7	342.1	311.5	255.1	216.0
Off-Road Mobile Sources	153.9	129.7	111.1	102.2	141.0	118.4	101.2	93.4
Total	575.4	500.9	424.4	376.2	573.1	504.7	428.4	380.1
Sulfur Dioxide								
Stationary Sources	20.4	20.6	21.5	22.0	19.6	20.0	20.9	21.4
Area Sources	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8
On-Road Mobile Sources	2.6	0.7	0.7	0.7	2.5	0.7	0.7	0.7
Off-Road Mobile Sources	2.4	0.8	0.8	0.8	2.3	0.8	0.8	0.8

Table A-1
Emissions Inventory Summary for the San Joaquin Valley PM_{2.5} Nonattainment Area
(tons per day)

	Annual Average Day				Winter Average Day			
	2005	2009	2012	2014	2005	2009	2012	2014
Total	26.4	23.0	23.8	24.5	25.2	22.3	23.1	23.7
Volatile Organic Compounds								
Stationary Sources	121.5	121.9	123.9	129.5	101.4	102.0	103.4	107.1
Area Sources	140.7	122.4	125.5	128.0	145.4	127.1	129.6	131.7
On-Road Mobile Sources	94.8	76.5	64.8	57.2	99.7	80.9	68.1	59.9
Off-Road Mobile Sources	62.7	54.3	50.8	48.5	55.7	48.6	45.8	43.9
Total	419.8	375.2	365.0	363.2	402.2	358.6	346.9	342.6
Ammonia								
Stationary Sources	19.8	21.0	22.2	23.0	19.8	21.0	22.2	23.0
Area Sources	355.9	381.9	405.8	423.1	356.9	382.9	406.7	424.0
On-Road Mobile Sources	6.2	5.3	5.0	4.8	6.2	5.3	5.0	4.8
Off-Road Mobile Sources	0	0	0	0	0	0	0	0
Total	382.0	408.3	433.0	451.0	382.9	409.2	433.9	451.8

Source: SJV 2008 PM_{2.5} Plan, Appendix B, Tables B-1 to B-5.

B. Air Quality Modeling

1. Requirements for Air Quality Modeling

The PM_{2.5} implementation rule requires states to submit an attainment demonstration based on modeling results. Specifically, 40 CFR § 51.1007(a) states:

For any area designated as nonattainment for the PM_{2.5} NAAQS, the State must submit an attainment demonstration showing that the area will attain the annual and 24-hour standards as expeditiously as practicable. The demonstration must meet the requirements of § 51.112 and Appendix W of this part and must include inventory data, modeling results, and emissions reduction analyses on which the State has based its projected attainment date. The attainment date justified by the demonstration must be consistent with the requirements of § 51.1004(a). The modeled strategies must be consistent with requirements in § 51.1009 for RFP and in § 51.1010 for RACT and RACM. The attainment demonstration and supporting air quality modeling should be consistent with EPA's PM_{2.5} modeling guidance.¹⁰

See also 72 FR 20586, 20665.

Air quality modeling is used to establish emission attainment targets, a combination of emissions of PM_{2.5} and PM_{2.5} precursors that the area can accommodate without exceeding the NAAQS, and to assess whether the proposed control strategy will result in attainment of the standards. Air quality modeling is performed for a base year and compared to air quality monitoring data in order to determine model performance. Once the performance is determined to be acceptable, future year emissions inventory changes are simulated to determine the relationship between emissions reductions and changes in ambient air quality throughout the air basin.

The procedures for modeling PM_{2.5} as part of an attainment SIP are contained in EPA's "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for the 8-Hour Ozone and PM_{2.5} NAAQS and Regional Haze."

2. Air Quality Modeling in the SJV 2008 PM_{2.5} Plan

The 2008 PM_{2.5} Plan uses multiple modeling analyses to demonstrate attainment of the PM_{2.5} NAAQS in the SJV. It mainly relies on several variants of an approach based on receptor modeling for the annual PM_{2.5} NAAQS. This approach begins with Chemical Mass Balance (CMB) modeling, which distinguishes the ambient PM_{2.5} contributions of several broad emissions source categories based on how they match the chemical species components of PM_{2.5} measurements. The CMB results are then refined with emissions inventory data to distinguish additional source categories, an area of influence analysis to better reflect particular sources affecting a monitor, and information from past photochemical modeling to assess how

¹⁰ EPA's November 9, 2005 final rule revising the "Guideline on Air Quality Models" in 40 CFR part 51, Appendix W is available at www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf.

secondarily formed PM_{2.5} will respond to changes in precursor emissions. Several variants of this approach are used, with CMB results from different locations and different base case years. This modeling only addresses the annual PM_{2.5} standard.

The Plan also includes an attainment demonstration using photochemical modeling with the Community Multiscale Air Quality (CMAQ) model. This modeling incorporates data collected during 2000 California Regional Particulate Air Quality Study (CRPAQS) and addresses both the annual and 24-hour PM_{2.5} standards. It is considered the main attainment demonstration, with the receptor modeling as a corroborating analysis.¹¹

Based on verb tenses and on the structure of the Plan and appendices, it appears that the receptor modeling was completed first and was later supplemented with the photochemical modeling. Both the receptor and photochemical modeling focused primarily on the annual standard. The annual standard was viewed as controlling in the sense that any control strategy that provided for annual standard attainment would also provide sufficient emissions reductions for 24-hour standard attainment. At the time the Plan was prepared in 2006, ambient data for PM_{2.5} was consistent with attainment of the 24-hour NAAQS. See 2008 PM_{2.5} Plan, Appendix A, Table A-9.

The 2008 PM_{2.5} Plan discusses air quality modeling in the “Executive Summary,” Chapter 3 “What is Needed to Demonstrate Attainment?,” Appendix E “District Additions to the Conceptual Model,” Appendix F “SJV PM_{2.5} SIP Modeling Protocol,” Appendix G “Regional Air Quality Modeling,” Appendix H “Weight of Evidence,” and the additional appendices “2014 Receptor Modeling Documentation,” “Meteorological Model Performance Analysis,” and “Regional Model Performance Analysis.” CARB provided additional modeling documentation in “Three-Dimensional Grid-Based Photochemical Modeling-Related Responses to the US EPA’s Technical Support Document for the Proposed Action on the San Joaquin Valley 2008 PM_{2.5} Plan and the San Joaquin Valley Portions of the Revised 2007 State Strategy,” California Air Resources Board, January 28, 2011, including Appendices A through D (hereafter, CARB modeling supplement).

A conceptual model of PM_{2.5} formation in the San Joaquin Valley is in Appendices E and F, with additional material in Appendix H. The principal discussion of the photochemical modeling is in Appendices F and G, along with the two model performance appendices. Receptor modeling is covered in Chapter 3, Appendix F, and the Receptor Modeling Documentation appendix. The Weight of Evidence analysis in Appendix H discusses both the photochemical and receptor modeling, as well as ambient trends and other data in support of the attainment demonstration.

Consistent with the Guidance, EPA considers the photochemical modeling to be the main basis for the PM_{2.5} attainment demonstration. Guidance, p. 15. The receptor modeling may be considered supplemental analysis to corroborate the photochemical modeling results, e.g. as part of a weight of evidence approach. Guidance, p. 213.

¹¹ *Memorandum*. Scott Bohning, EPA Region 9, Air Quality Analysis Office to Docket No. EPA-R09-OAR-2010-0516, June 17, 2011, re: Notes on call w/ ARB re: VOC as a PM_{2.5} plan precursor in SJV, found in the docket for this rule.

a. Conceptual Description

A conceptual description is a qualitative way of characterizing the nature of an area's nonattainment problem. It can be helpful in identifying potential stakeholders and for developing a modeling protocol. It can also influence the choice of air quality model, modeling domain, grid cell size, priorities for quality assuring and refining emissions estimates, and the choice of initial diagnostic tests to identify potentially effective control strategies. In general, a conceptual description is useful for helping a state to identify priorities and allocate resources in performing a modeled attainment demonstration.

The Guidance at pp. 128-130 lists 13 elements that should be addressed in the conceptual description. These are:

1. nonattainment problem (e.g., local versus regional)
2. relative importance of primary and secondary components of PM_{2.5}
3. most prevalent components of measured PM_{2.5}
4. components of measurements versus emissions
5. areas with large gradients
6. indications of limiting precursor for secondary formation
7. monitored violations at locations subject to mesoscale wind patterns (e.g., at a coastline) differing from the general wind flow
8. recent changes in PM emissions in or near the nonattainment area
9. trends in design values or other air quality indicators that have accompanied emissions changes
10. spatial pattern to trends in design values or other air quality indicators
11. past modeling results
12. distinctive meteorological measurements coinciding with exceedances
13. correlations of PM or components with each other and other pollutants

The Plan contains ample discussion of the PM_{2.5} problem in the San Joaquin Valley. Much of the same material is covered in Chapter 3 (pp. 3-3 – 3-9); most of Appendix E; the modeling protocol in Appendix F at pp. F-13 – F-18, F-21, F-52 – F-56; and various parts of Appendix H. Appendix E on “District Additions to the Conceptual Model” has substantial discussion of the effect on PM_{2.5} concentrations of seasonal changes, the influence of meteorology including fog, dry deposition, and emissions variations. Analysis of data collected during the 2000 CRPAQS substantially added to the understanding of PM_{2.5} in the SJV. The cited chapters and appendices excerpt a number of conclusions from papers stemming from CRPAQS.¹²

¹² Appendix F at p. F-71 also includes by reference the paper “Conceptual Model of Particulate Matter Pollution in the California San Joaquin Valley,” Document Number CP045-1-98, 8 September 1998, prepared by: Betty Pun and Christian Seigneur, Atmospheric and Environmental Research, Inc. This paper has conclusions

In brief, the PM_{2.5} problem in the San Joaquin Valley is mainly due to secondary particulates, especially in winter, with a substantial primary component throughout the year and during some winter episodes. PM_{2.5} concentrations are much higher in winter than in summer. Concentrations in April through September are generally less than 15 µg/m³, the level of the annual NAAQS. Nonattainment of the annual NAAQS is driven by high wintertime concentrations, including episodes during stagnant, moist conditions. Stagnant conditions and surface radiation inversions restrict pollutant dispersion, allowing concentrations to build to high levels. The enclosure of the SJV by mountain ranges restricts air flow and helps the inversion form a cap over the polluted air. Concentrations are highest at the southern end of the Valley, which is more enclosed than the northern end and experiences stagnation during winter and recirculation of polluted air via the Fresno eddy during summer.

The dominant component of PM_{2.5} in the SJV is ammonium nitrate, formed from the abundant ammonia emissions in this agricultural area and NO_x emissions from on-road motor vehicles, other mobile sources, and various fuel-combustion stationary sources. Ammonium nitrate formation is enhanced during the cool, moist winter months. Based on ambient concentrations and on previous modeling work, ammonia appears to be so abundant that formation of ammonium nitrate is limited by the rate of HNO₃ (nitric acid) formation via oxidation of NO_x, rather by the availability of ammonia. In addition to ammonium nitrate, organic carbon (OC) can also be a significant component of PM_{2.5}. The main sources of OC are agricultural vegetative burning, residential wood combustion, other direct sources such as vehicles, and a smaller contribution from secondary organic aerosols. During CRPAQS it was found that organic carbon has a strong spatial gradient, being much higher in urban areas, especially during high PM_{2.5} episodes. This gradient was explained as being due to the greater vehicle emissions and residential wood combustion in cities. Ammonium sulfate is a relatively small component of secondary PM_{2.5} in the SJV unlike areas in the eastern part of the United States where it is the dominant component of secondary PM_{2.5}.

As discussed at 2008 PM_{2.5} Plan pages 3-32 and F-39, the annual standard is the focus of the modeling analysis because ambient concentrations of PM_{2.5} in the SJV were below the 24-hour PM_{2.5} NAAQS during the development of the Plan. There were thus no 24-hour episodes suitable for speciated rollback in the receptor modeling approaches and little need to focus on the 24-hour standard for the photochemical modeling, although 24-hour modeling was performed.

EPA finds that the conceptual description of the PM_{2.5} problem in SJV provided in the Plan is adequately documented, convincing, and formed an adequate basis for the development of the modeling protocol and the analysis work.

b. Modeling Protocol

A modeling protocol should detail and formalize the procedures for conducting all phases of the modeling study, such as describing the background and objectives for the study, creating a schedule and organizational structure for the study, developing the input data, conducting model performance evaluations, interpreting modeling results, describing procedures for using the model to demonstrate whether proposed strategies are sufficient to attain the NAAQS, and

similar to those covered in the Plan sections listed above, although it is based on analysis of data collected during an earlier study, the 1995 Integrated Monitoring Study (or IMS95).

producing documentation to be submitted for EPA Regional Office review and approval. The Guidance at pp. 133-134 describes a minimum list of topics to be addressed in the modeling protocol:

1. Overview of Modeling/Analysis Project
 - a. Management structure
 - b. Technical committees or other communication procedures to be used
 - c. Participating organizations
 - d. Schedule for completion of attainment demonstration
 - e. Description of the conceptual model for the nonattainment area (or Class I area(s))
2. Model and Modeling Inputs
 - a. Rationale for the selection of air quality, meteorological, and emissions models
 - b. Modeling domain
 - c. Horizontal and vertical resolution
 - d. Specification of initial and boundary conditions
 - e. Episode selection
 - f. Description of meteorological model setup
 - g. Development of emissions inputs
 - h. Geographic area identified for application of the attainment test(s)
 - i. Methods used to quality-assure emissions, meteorological, and other model inputs
3. Model Performance Evaluation
 - a. Description of the ambient data base
 - b. Description of the evaluation procedures
 - c. Identification of possible diagnostic testing that could be used to improve model performance
4. Supplemental Analyses
 - a. Description of the additional analyses to be completed to corroborate the model attainment test
 - b. Outline of the plans for conducting a weight of evidence determination, should it be necessary
5. Procedural Requirements
 - a. Identification of how modeling and other analyses will be archived and documented
 - b. Identification of specific deliverables to EPA Regional Office

2008 PM_{2.5} Plan's modeling protocol is contained in Appendix F, with descriptions of both the receptor modeling approaches and the photochemical modeling. Many aspects of the photochemical modeling that are suitable for inclusion in a protocol are also covered in Appendix G and the "Regional Model Performance Analysis" appendix.

The protocol covers all of the above topics, with the exception of identification of how modeling and other analyses will be archived. In the Plan there is no discussion of this topic, nor any description of how modeling data files may be accessed, should EPA or other interested parties wish to replicate the results of the analysis. *See* Guidance, p. 117. However, section 1 of

the CARB modeling supplement describes the data storage requirements for the modeling files, and discusses how they may be requested (pp. 2 - 3).

c. Air Quality Model Selection

A model should meet several general criteria for it to be a candidate for consideration in an attainment demonstration. Guidance, p.136. These general criteria are consistent with requirements in 40 CFR § 51.112 and 40 CFR part 51, Appendix W. EPA does not recommend a specific model for use in attainment demonstrations. At present, there is no single model which has been extensively tested and shown to be clearly superior to its alternatives. Thus, 40 CFR Part 51 Appendix W does not identify a preferred model for use in attainment demonstrations of the PM_{2.5} NAAQS. Based on the language in Appendix W, models used for these purposes should meet requirements in the Appendix for alternative models.

States should use a non-proprietary model, that is, a model whose source code is available for free (or for a reasonable cost) and whose code can be revised by the state in order to perform diagnostic analyses and/or to improve the model's ability to describe observations in a credible manner. A model should meet several additional prerequisites before being used to support an attainment demonstration. It should be:

1. revised in response to a scientific peer review,
2. appropriate for the specific application on a theoretical basis,
3. used with a data base which is adequate to support its application,
4. shown to have performed well in past ozone or PM modeling applications (or if it is the first application, then the state should note why it believes the new model is expected to perform sufficiently); and
5. applied consistently with a protocol on methods and procedures.

2008 PM_{2.5} Plan's model selection is discussed at p. F-80 and p. G-2, with the Community Multiscale Air Quality (CMAQ) model selected. CMAQ is a "state-of-the-science [model that]... has been extensively peer-reviewed, is well-documented, and ... has been applied successfully in a range of environments." The Plan mentions certain California-specific updates to the model, but these are not described other than via a citation. However, the California-specific updates are described in CARB modeling supplement, section 3.2, p.17.

The California-specific updates included: 1) fixing a model bug involving overly large fine PM deposition velocities that caused negative concentrations, 2) accommodation of hourly average emissions instead of the CMAQS default instantaneous assumption, 3) incorporation of a time-varying fine PM size distribution, 4) using a smaller standard deviation for the coarse PM size distribution to keep it within the appropriate 2.5 – 10 µm size range, 5) a lower vertical diffusion coefficient to better reflect the stagnation in California's Central Valley, 6) a cap on ionic strength used in activity coefficient calculations for the aqueous phase oxidation of (bi)sulfate, 7) the addition of dimethyl sulfide (DMS) to the chemical mechanism to reflect the sulfur compound emissions from the large oceanic portion of the modeling domain (expected to be a larger proportion of the total as anthropogenic sulfur emissions have been reduced in recent decades). For each of these changes, a brief description and rationale is presented; the changes

appear to have a reasonable basis, and to have been aimed at improving model performance suggested by problems encountered in applying the default model to conditions in the SJV.

There is no discussion of any alternative models considered. EPA, however, finds that the choice of the CMAQ model is adequately justified because the EPA-sponsored CMAQ is explicitly mentioned in the Guidance (p. 138) as being a suitable model.

2008 PM_{2.5} Plan's chemical mechanism selection is also discussed at p. F-80 and p. G-2, with SAPRC-99 selected for the gas phase mechanism, and CMAQ's AE4-AQ as the aqueous phase mechanism. These are little described except for a journal paper citation.

There is little discussion of alternative mechanisms considered. EPA, however, finds that the use of SAPRC is adequately justified because SAPRC is a well-known and widely-used mechanism.

d. Episode Selection

We recommend one of two possible approaches for the modeling the 24-hour PM_{2.5} NAAQS (Guidance, p. 147):

- 1) Model every day for a full year (or multiple years). This is recommended for both dispersion modeling of primary PM_{2.5} components and photochemical modeling of secondary and primary components. Many areas that violate the 24-hour PM_{2.5} NAAQS will also violate the annual PM_{2.5} NAAQS. Therefore, full year modeling may already exist or is being planned for the annual NAAQS attainment test. Modeling at least a full year will also help ensure that a sufficient number of days are included in the relative response factor (RRF) calculations.
- 2) Model episodes when high PM_{2.5} concentrations occur. Similar to modeling for the ozone NAAQS, episodes should be selected where PM_{2.5} concentrations are greater than the NAAQS (in this case, the 1997 standard of 65 µg/m³) and are close to the baseline design value. Also similar to ozone modeling, data analyses can be completed to help select a variety of meteorological episodes which lead to high PM_{2.5} concentrations. In some cases, there may be very limited conditions which lead to high 24-hour average PM_{2.5} concentrations, and in other cases there may be a wide variety of cases. The specific situation in each nonattainment area will determine the number of episodes and the time periods which need to be modeled. For example, if exceedance-level PM_{2.5} concentrations in an area only occur in the winter, then a limited number of winter days can be modeled. In other areas, exceedance days may occur in all seasons.

2008 PM_{2.5} Plan's episode selection is not discussed, instead a full year of modeling was performed. As mentioned above, there was little need to focus on the 24-hour standard attainment since ambient concentrations were already consistent with attainment of the NAAQS at the time the Plan was developed. Therefore there was no selection of particular periods or episodes of interest for the 24-hour NAAQS, although 24-hour modeling was in fact performed.

EPA finds that this is adequate. Since nonattainment of the annual standard in the SJV is known to be driven by frequent particular episodes in winter, it would have been preferable to

choose and examine these particular periods in more detail in order to ensure the model performs well during such periods. However, because the model is used in a relative sense in the attainment demonstration, the design value already attaining the 24-hour standard would have been scaled by a modeled RRF that reflects emissions reductions, and so the predicted 24-hour PM_{2.5} design value would also have attained the standard.

e. Domain, Domain Size, and Spatial Resolution

i. Domain Size

The principal determinants of model domain size are the nature of the PM_{2.5} problem and the scale of the emissions which impact the nonattainment area. Isolated nonattainment areas that are not affected by regional transport of PM and its precursors may be able to use a relatively small domain. Some areas of the western U.S. may fall into this category. The modeling domain should be designed so that all major upwind source areas that influence the downwind nonattainment area are included in the modeling domain. The influence of boundary conditions should be minimized to the extent possible. Guidance, p. 153.

ii. Horizontal Resolution

EPA is comfortable recommending that states may use grid cell sizes as large as 12 kilometers (km) for urban scale applications addressing secondary components of particulate matter. We are less sure about an acceptable upper limit for cell size in applications addressing primary components. We believe it is prudent to assume that, in some cases, cells as small as 4 km (or possibly smaller) are needed. A state implementing the modeling/analysis protocol may wish to perform a diagnostic test using a grid model without chemistry to see whether estimated RRF's for primary components are affected if one decreases the grid cell size from 12 km to 4 km. Alternatively, large sources of primary PM can be modeled with a dispersion model or a combination of grid and dispersion models. We expect that modeling analyses for nonattainment areas will use grid cell sizes of 12 km or less. If a regional scale model is applied, most of the domain will likely cover rural/remote areas or locations which are not out of compliance with the NAAQS. For the regional outer nest of the domain, grid cells as large as 36 km may be used. Guidance, p. 157.

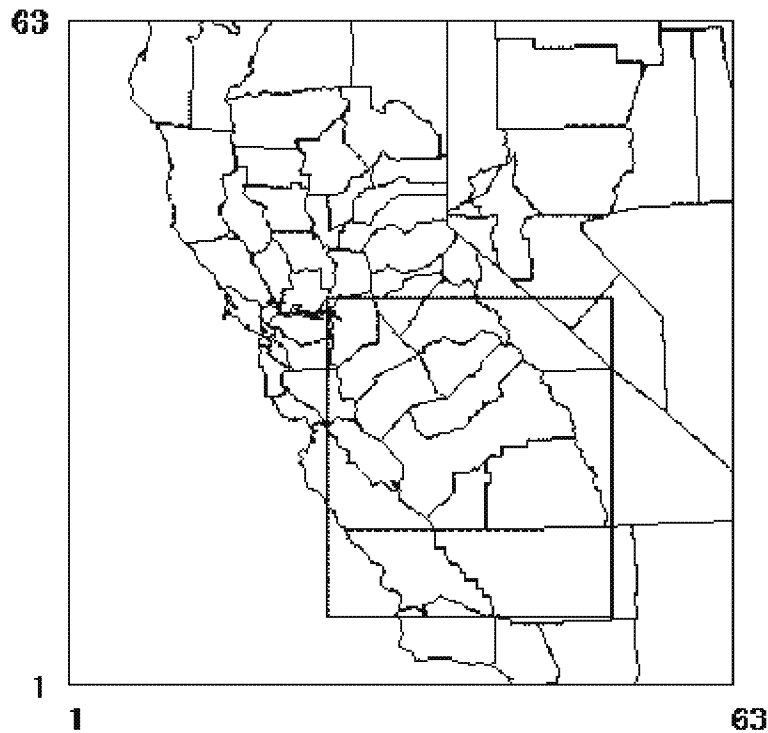
iii. Vertical Layers

There is no correct minimum number of vertical layers needed in an attainment demonstration. The vertical resolution will vary depending on the application. Greater resolution allows more precise estimation of mixing heights and avoids unrealistic step increases in mixing; alignment with the layers in the meteorological model can affect accuracy; the lowest layer should generally be no more than 50 meters thick; resolution above the boundary layer can generally be coarser. Recent applications of one atmosphere models (with model tops at 100 millibars (mb)) have used anywhere from 12 to 21 vertical layers with 8-15 layers approximately within the boundary layer (below 2500 m) and 4-6 layers above the Planetary Boundary Layer (PBL). Guidance p. 159.

2008 PM_{2.5} Plan's modeling domain is discussed at pp. F-39, F-81, and especially p. G-3, and is shown on a map on page G-18. The domain uses a nested grid, with the inner domain containing the entire District and nonattainment area. The inner domain has a 4 km grid resolution and measures 320 by 356 km (80 by 89 grid cells). This inner domain is nested within

an outer domain covering most of California (CCAQS domain), extending from the Pacific Ocean in the west to the deserts in Nevada and southern California in the east, and from the Tehachapi Mountains in the south to the Sacramento Valley in the north. It has a 12 km resolution and measures 756 km (63 grid cells) in both horizontal dimensions. Both domains used 15 vertical layers of varying thickness up to the 100 mb pressure level (the top of the meteorological domain) with the surface layer approximately 30 m thick.

CCAQS modeling domain with the SJV modeling domain inset



Source: 2008 PM_{2.5} Plan, Appendix G, Figure 1, p. G-18

EPA finds the domain to be adequate, even though the documentation is sparse on its selection. The Plan has no discussion of any rationale for the particular domain chosen or its horizontal and spatial resolution. Nevertheless, the inner domain meets all of the Guidance modeling domain characteristics listed above for spatial resolution and layer thickness. It also appears adequate for minimizing the influence of boundary conditions, since the east and west boundaries are in areas of sparse population, and the southern boundary is beyond a mountain range. The northern boundary is less satisfactory from this standpoint but is justified on the basis the Sacramento area being a different nonattainment area and all counties exceeding the PM_{2.5} NAAQS being located in the southern end of the San Joaquin Valley, well away from the northern boundary. In addition, this inner domain is nested within an outer one that also meets the Guidance criteria.

f. Initial and Boundary Conditions

If there is no larger regional model application available, then it is recommended that background boundary conditions be used to specify initial and boundary concentrations for the attainment demonstration modeling. However, concentration fields derived from a larger domain regional or global chemistry model (i.e., the nesting approach) is considered more credible than the assumption of static concentrations, since the pollutant concentration fields reflect simulated atmospheric chemical and physical processes driven by assimilated meteorological observations. Therefore, EPA recommends using boundary conditions derived from a regional or global scale model, whenever possible. We also recommend using a ramp-up period by beginning a simulation prior to the period of interest to diminish the importance of initial conditions. The recommended ramp-up period is at least 5-10 days for PM_{2.5}. Diagnostic testing which indicates a large impact on the model results from initial or boundary conditions may indicate that the domain is not large enough or the ramp-up period is too short. In either case, it should generally be assumed that initial and boundary conditions do not change in the future. The use of altered initial or boundary conditions in the future year should be documented and justified. Guidance, p. 153.

Plan initial and boundary conditions are discussed at p. F-81 and p. G-3. Boundary conditions for the outer domain were taken from the global chemical transport Model for Ozone And Related Chemical Tracers (MOZART). Initial conditions were estimated as an average of these conditions. The outer domain's boundary conditions varied monthly, while the inner domain's were computed from modeling of the outer domain and varied hourly. The use of 8-day ramp-up (a.k.a. spin up) periods prior to each model simulation minimized the effect of uncertain initial conditions on the modeling. Page F-73 in the 2008 PM_{2.5} Plan has a table of annual average boundary conditions for the various chemical species; there is no information on the monthly or hourly values. There is no discussion of any diagnostic testing.

EPA finds the initial and boundary conditions are acceptable, although sparsely documented (the preceding summary is essentially the full description in the Plan). Conditions appear to have been based on a reasonable procedure, and the ramp-up period appears adequate.

g. Meteorological Model

i. Meteorological Model Selection

A description of the methods used to generate the meteorological fields should be included in the modeling protocol. In cases in which standard meteorological modeling (e.g. MM5, RAMS, or WRF in a retrospective analysis mode) is not used, EPA recommends that a detailed description of the technique that will be used to generate the three-dimensional meteorological fields be shared with the appropriate EPA regional office(s) prior to conducting the air quality modeling analysis. Guidance, p. 161.

2008 PM_{2.5} Plan's meteorological model selection is discussed at p. F-81 and p. G-4, with MM5 selected. While there is no discussion of alternative meteorological models, since MM5 is well-known and widely used and explicitly mentioned in the Guidance (p. 160) as being a suitable model, EPA finds that the model choice is adequately justified.

ii. Meteorological Model Domain

It is expected that most attainment demonstrations will cover large areas and use nested grids. The outermost grid should capture all upwind areas that can reasonably be expected to influence local concentrations of PM_{2.5}. In terms of selecting an appropriate meteorological modeling domain, a state should extend the grid 3 to 6 cells beyond the domains of each air quality modeling grid to avoid boundary effects. For example, if 4 km grid cells are to be used in the fine portion of a nested regional air quality model, then the meteorological fields at this detail would need to extend 12-24 km beyond the bounds of the 4 km grid used for air quality predictions. In terms of grid resolution, EPA recommends that the dynamic meteorological models use the same grid resolution as desired for the air quality model applications. In some cases, however, this may not always be feasible. One possible reason for modeling with meteorology using a different grid resolution is in the case of unacceptable model performance from the meteorological model at the desired grid resolution. In other instances, the need for finer resolution may be emissions-driven more than meteorologically-driven and the costs do not warrant the generation of additional resolution in the meteorological data. In these specific situations it is recommended that the air quality model application use available results from meteorological models on the next coarser scale (i.e., 36 km for a desired 12 km estimate, 12 km for a desired 4 km estimate). The coarse grid meteorological fields can be mapped to the more finely resolved air quality modeling domain.

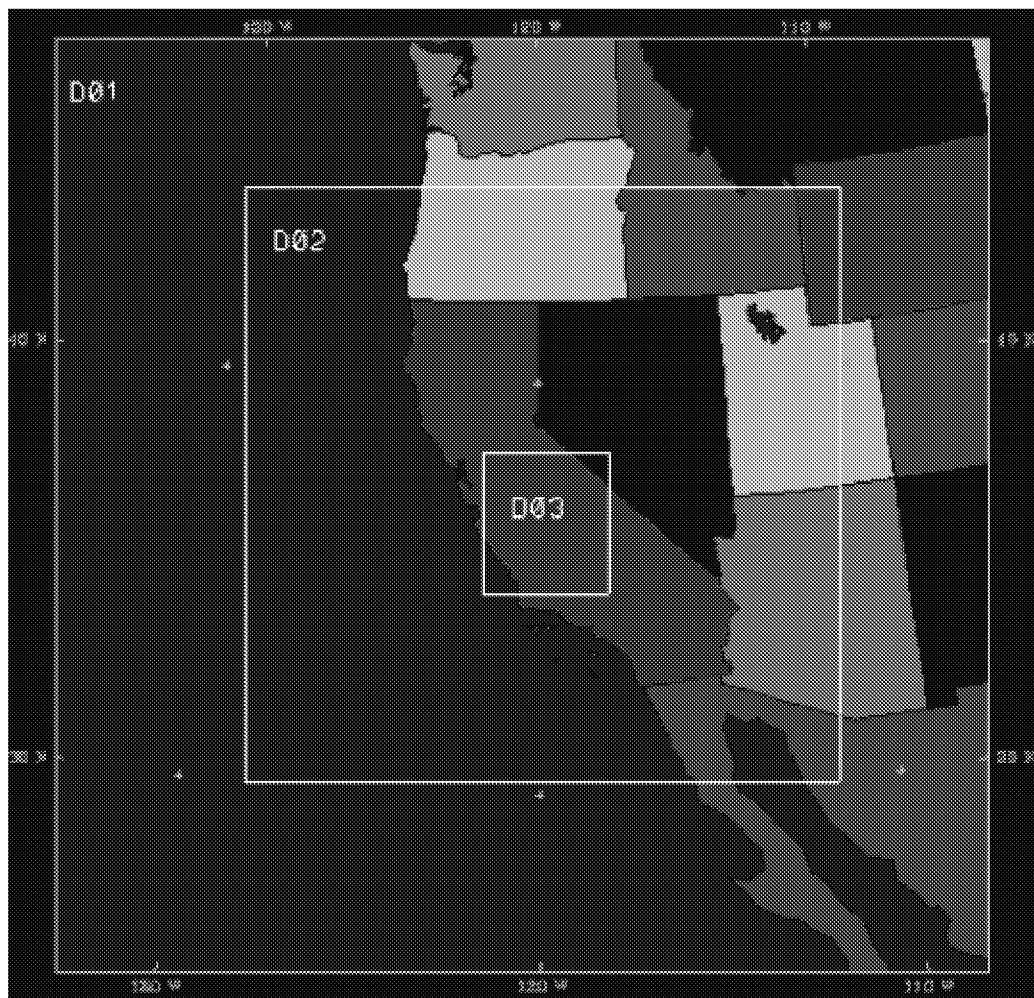
iii. Physics Options

Most meteorological models have a suite of physics options that allow users to select how a given feature will be simulated. For example, there may be several options for specifying the planetary boundary layer scheme or the cumulus parameterization. In many situations, the optimal configuration cannot be determined without performing an initial series of sensitivity tests which consider various combinations of physics options over specific time periods and regions. While these tests may not ultimately conclude that any one configuration is clearly superior at all times and in all areas, it is recommended that these sensitivity tests be completed, as they should lead to a modeling analysis that is best-suited for the domain and period being simulated. Typically, the model configuration which yields predictions that provide the best statistical match with observed data over the most cases (episodes, regions, etc.) is the one that should be chosen, although other more qualitative information can also be considered. Additionally, model configurations should be designed to account for the pollutants and time periods that are of most interest. As an example, a wintertime PM simulation in the Midwest (with high measured nitrate concentrations) may need a meteorological model configuration that employs a land-surface model that properly handles snow covered fields and their effects on boundary layer humidities and temperatures.

2008 PM_{2.5} Plan's meteorological model setup is discussed at p. F-81 and p. G-4 and in the appendix "Meteorological Model Performance Analysis" (hereafter, MMPA). A 14-month simulation was done (the year 2000 plus a month at either end), using three nested grids, having horizontal resolutions of 36 k, 12 km, and 4 km, from outermost to innermost. Maps of the domains appear as Figure 2 on p.G-19 and Figure 1 on p. 2 on of MMPA. (The innermost domain in the two figures does not match; the one on the map in Appendix G appears to be incorrect since it is square, whereas the horizontal dimensions are stated to be 94x85 grid cells in both appendices.)

The meteorological model used 30 vertical layers, extending up to the 100 mb pressure level, with the surface layer 30 m deep. The MMPA at pp. 2-3 states that sensitivity testing using 50 layers and a 15 m surface layer to better resolve atmospheric processes for stable winter conditions, but this doubled run times with little improvement in model results. (The context implies that this refers to the meteorological model rather than the air quality model.) The MMPA goes on to state “Many sensitivity studies were conducted using various model options to gain better agreement with observations.” The optimal configuration included various physics options listed, e.g., Grell cumulus parameterization, Blackadar boundary layer scheme, Dudhia ice scheme, Dudhia cloud radiation scheme, and Blackadar soil model. Analysis nudging was used for the outer 36 km and 12 km grids.

**The Location of the Three Nested Grids Designed to Study the
Meteorology And Air Quality in the SJV Domain**



Source: 2008 PM_{2.5} Plan “Meteorological Model Performance Analysis,” p. 2.

EPA finds that the meteorological domain and model set-up are acceptable although sparsely documented (the preceding summary is majority of the description provided in the

Plan). It appears that there was substantial effort to improve the meteorological model performance before an optimal configuration was chosen.

h. Meteorological Model Performance

EPA recommends that states devote appropriate effort to the process of evaluating the meteorological inputs to the air quality model as we believe good meteorological model performance will yield more confidence in the predictions from the air quality model. This evaluation should determine if the meteorological model output fields represent a reasonable approximation of the actual meteorology that occurred during the modeling period. This can be done via an operational evaluation (i.e., quantitative, statistical, and graphical comparisons). A second objective of the evaluation should be to identify and quantify the existing biases and errors in the meteorological predictions in order to allow for a downstream assessment of how the air quality modeling results are affected by issues associated with the meteorological data. This evaluation can be done via a more phenomenological assessment (i.e., generally qualitative comparisons of observed features versus their depiction in the model data). Guidance, p. 163.

Operational Evaluation (Guidance, p. 163): The operational evaluation results should focus on the values and distributions of specific meteorological parameters as paired with and compared to observed data. It is recommended that the observation-model matching be paired as closely as possible in space and time. Typical statistical comparisons of the key meteorological parameters will include: comparisons of the means, mean bias, mean normalized bias, mean absolute error, mean absolute normalized error, root mean square error (systematic and unsystematic), and an index of agreement. For modeling exercises over large domains and entire seasons or years, it is recommended that the operational evaluation be broken down into individual segments such as geographic sub-regions and/or months/seasons to allow for a more comprehensive assessment of the meteorological strengths and weaknesses.

Phenomenological Evaluation (Guidance, p. 167): Within the conceptual description of a particular modeling exercise, EPA recommends that a state identify and qualitatively rank in importance the specific meteorological parameters that influence air quality. When evaluating meteorological models or any other source of meteorological data, the focus of the phenomenological evaluation should be on those specific meteorological phenomena that are thought to strongly affect air pollution formation and transport within the scope of a specific analysis. It is expected that this event-oriented evaluation will need to summarize model performance in terms of statistical metrics such as probability of detection and false alarm rate. As an example of a potential phenomenological analysis, many regional air quality modeling exercises attempt to assess the effects of transport of emissions from one area to a downwind area with an intent to establish source-receptor relationships. For these types of modeling analyses, accurate transport wind trajectories are needed to properly establish these source-receptor linkages. In this type of model application, a useful event-based meteorological evaluation would be to compare model-derived trajectories versus those based on ambient data to determine what error distance can be associated with the model fields.

2008 SJV Plan's meteorological model performance is discussed in the appendix "Meteorological Model Performance Analysis" (MMPA). In addition, CARB modeling supplement includes a phenomenological model evaluation, and its Appendixes A through D provide exhaustive documentation on performance of the model, with many time series and spatial plots for wind speed, wind direction, temperature. Appendix A has plots and statistics for

modeled vs. observed temperature, relative humidity, and wind components for each meteorological station, and also accumulated precipitation for some stations. Appendix B has some of the material that is in the “Meteorological Model Performance Analysis” in the Plan, but also many histograms showing occurrence frequency of simulated and observed wind speeds, temperature, and relative humidity for each month, for the stations in the vicinity of Fresno. Appendix C has weekly time series plots for wind speed, wind direction, and temperature for each station. Finally, Appendix D has hourly spatial plots of predicted and observed surface winds, portrayed as a wind vector for each grid cell of the modeling domain. There is an operational evaluation using three methods for temperature, relative humidity, and horizontal wind components for the full year and by season.

Evaluation Method 1 considers mean and standard deviation, correlation, root mean square error, mean bias, and index of agreement; this information is stated to be in Attachment A, which is not provided. Results are stated (MMPA p. 6) to be generally well-correlated but less so for wind components. Relative humidity is generally over-predicted. Agreement between predictions and observations varies little seasonally.

Evaluation Method 2 involves examination of frequency histograms for temperature, wind speed, and humidity for 24-hour periods in alternate months. This information is stated to be in Attachment B, which is not provided. The MMPA states (p. 8): “The frequency distribution of air temperature, relative humidity, and mixing ratio for observations and model results show reasonably good agreement. There are only small differences in observed and simulated diurnal wind speed patterns.” This appears to be the case for the Fresno examples given.

Finally, Evaluation Method 3 consists of hourly comparisons for wind speed, direction, and temperature over two five-day periods within each modeled month. This information is stated to be in Attachment C, which is not provided, although graphs of a December, 1990 five-day period for Fresno are shown. The MMPA (p. 9) concludes “the model can capture the diurnal evolution of observed wind speed, wind direction and temperature variations reasonably well,” despite the fact that “the estimates for the evolution of the wind speed and direction differ somewhat. However, the examination of all figures given in Attachment C indicates that the model does capture the overall evolution.”

Section 2 of the CARB modeling supplement (pp. 4 – 8) contains a phenomenological evaluation of the meteorological model performance, including an assessment of seasonal variation. It describes some the meteorological and topographic factors leading to high pollutant concentrations. It also describes some alternate MM5 model configurations that were evaluated, including analysis nudging of the wind field, various numbers of vertical layers, and various physics model options such as the MRF, Blackadar, Gayno-Seaman, and ETA schemes for the evolution of the Planetary Boundary Layer (PBL). Each configuration was evaluated using time series graphs and statistics based on simulation of a one-week period; no one configuration was found to be superior to the others. The seasonal assessment evaluated the MM5 simulation’s ability to replicate phenomena important to San Joaquin Valley pollutant formation and distribution, such as slope flows, sea breezes, and low wind speeds, as well as overall wind patterns and temperature gradients. The assessment concludes that sea breezes and slope flows are replicated well, although less so for the Sacramento delta region; wind speeds tended to be a bit larger than observed, but acceptable; temperature gradients tended to be a bit smaller than observed; and overall flow patterns were replicated well.

The overall conclusion in the Plan is that the MM5 simulations “reproduce the overall statistical characteristics of observed meteorological conditions”. There is some underestimate of maximum surface temperature, although the model is able to capture the large temperature variations that occur in some periods.

EPA finds the meteorological model performance was adequate, and thoroughly documented. It is apparent that substantial thought and effort went into the operational evaluation, including for particular periods throughout the year, rather than just overall annual statistics. The phenomenological evaluation also is adequate, with assessment of how well phenomena important to PM_{2.5} formation in the SJV are adequately captured in the meteorological modeling, including for various locations and times of year.

i. Emissions Inventory

Air quality modeling requires emissions inputs for base case, baseline, and future modeling years. Preparation of emissions data for air quality models for the base and future years requires several steps. First, a state needs to compile base-year inventories for its modeling region (e.g., the states and tribes in the modeling grid). For PM model applications, emissions inventories should include emissions of anthropogenic and biogenic VOC (speciated), NO_x, carbon monoxide, SO₂, NH₃, PM_{2.5} (speciated), and PM coarse (PMC). Second, modelers must collect ancillary data associated with the inventories, which prescribes the spatial, temporal, and chemical speciation information about the emissions inventory. Third, modelers use the ancillary data for emissions modeling. Emissions models spatially, temporally, chemically, and vertically allocate emissions inventories to the resolution needed by air quality model. Fourth, modelers must collect data on growth rates and existing control programs for use in projecting the base year emissions inventories to the future year, and then use an emissions model to prepare that future year inventory data for input to the air quality model. Fifth, emissions inventories that reflect the emissions reductions needed for attainment will have to be prepared for air quality modeling.

2008 PM_{2.5} Plan’s emissions inputs are discussed at p. G-3, and references to the need for emissions input to modeling appear at various places in Appendix F. Page G-3 states

A spatially, temporally, and chemically resolved emissions inventory of combined area, mobile, and point sources was generated using the California Emissions Forecasting System (CEFS) version 1.06 with offline adjustments. The inventory includes emissions estimates for gaseous and particulate species of anthropogenic and biogenic origin. Gridded hourly emissions were developed for the CMAQ modeling domain for the years 2000, 2005, and 2014 (baseline).

The Plan does not include a discussion of the procedures used to spatially or temporally allocate emissions for input to the model, other than the reference to CEFS. Quality assurance methods for emissions inputs are mentioned at p. G-3 but not discussed: “Quality assurance checks of domain emissions totals and spatial distribution were performed at various steps.” There are no tables of modeling emissions totals for various pollutants, source groupings, subareas, or seasons. There are no maps of emission density or diurnal time series of emissions, which could illustrate the spatial and temporal allocation, and help in understanding PM_{2.5} concentration variations over space and time.

EPA finds the modeling emissions inventory preparation procedures were adequate but sparsely documented (the preceding excerpts are essentially the full description in the Plan). It is apparent that substantial effort went into preparing emissions inputs in order for the model to have been run, but this effort is little documented in the Plan.

j. Air Quality Model Performance

PM_{2.5} consists of many components and is typically measured with a 24-hour averaging time. The individual components of PM_{2.5} should be evaluated individually. In fact, it is more important to evaluate the components of PM_{2.5} than to evaluate total PM_{2.5} itself. Apparent good performance for total PM_{2.5} does not indicate whether modeled PM_{2.5} is predicted for the right reasons (the proper mix of components). If performance of the major components is good, then performance for total PM_{2.5} should also be good. EPA recommends calculating statistics for components of PM_{2.5}, and PM precursors. Useful metrics include mean fractional bias and mean fractional error, normalized mean bias, and normalized mean error. Formulas for estimating these metrics are given in the Guidance. (Guidance, p. 203-204) Other statistics such as mean bias, mean error, root mean square error, correlation coefficients, etc. should also be calculated to the extent that they provide meaningful information. Since modeling for the PM_{2.5} NAAQS will likely require modeling different times of year, season-specific statistics and graphic displays are helpful for evaluating and diagnosing model performance. Statistics and graphics can be averaged for various time scales. For example, statistical metrics and scatter plots can show daily averaged ambient modeled pairs, monthly averaged pairs, quarterly (or seasonal averaged) pairs, or annual average pairs. Each of these averaging times can provide useful information. EPA recommends a range of different averaging times for annual or seasonal modeling. At a minimum, a state should examine daily averaged pairs and seasonal (or quarterly) averaged pairs. Because statistics and plots tend to look better as the averaging time increases from daily to monthly to quarterly to annual, daily pairs should always be examined to ensure a detailed look at model performance on the time scale of the FRM and STN measurements (24-hour average). Soccer plots provide a convenient way to display a summary of model performance (including bias and error at the same time). Bugle plots¹³ have variable bias and error goals, based on ambient concentrations. This allows for a higher percentage error and bias at very low concentrations. This recognizes the fact that models often have difficulty in accurately predicting near background concentrations and may be useful to prioritize examination of model performance within and near the non-attainment area(s) of interest. Additionally, priority may be placed on examination of the days that are potentially used in the attainment test (e.g., the days > 65 µg/m³ for 1997 24-hour PM_{2.5}).

2008 PM_{2.5} Plan's air quality model performance is discussed in the appendix "Regional Model Performance Analysis" (hereafter RMPA), starting at p. 6. Section 3.3 of the CARB modeling supplement (pp. 22 – 100) contains much additional detail.

The Plan does not include a discussion of the database used to evaluate model performance, other than many references to CRPAQS and referrals to the Central California Air

¹³ Fractional error and bias tend to be large at small concentrations, since then the uncertainty can be nearly as big as the concentration. Since fractional error varies relatively slowly with concentration, but then grows larger at low concentrations, the shape of the plot resembles a long tube with a flared end at low concentrations, reminiscent of a bugle.

Quality Studies' website (<http://www.arb.ca.gov/airways>). (For example, "The CRPAQS main field program collected extensive data during the period of December 1999 to February 2001" (p. F-32))." It is known from media accounts, CARB's website, the District's website (<http://www.valleyair.org/>), and study reports and journal articles, that the study involved intensive meteorological and air quality measurements, including measurements taken on towers and in aircraft and created a wealth of data useful for developing and evaluating model applications.

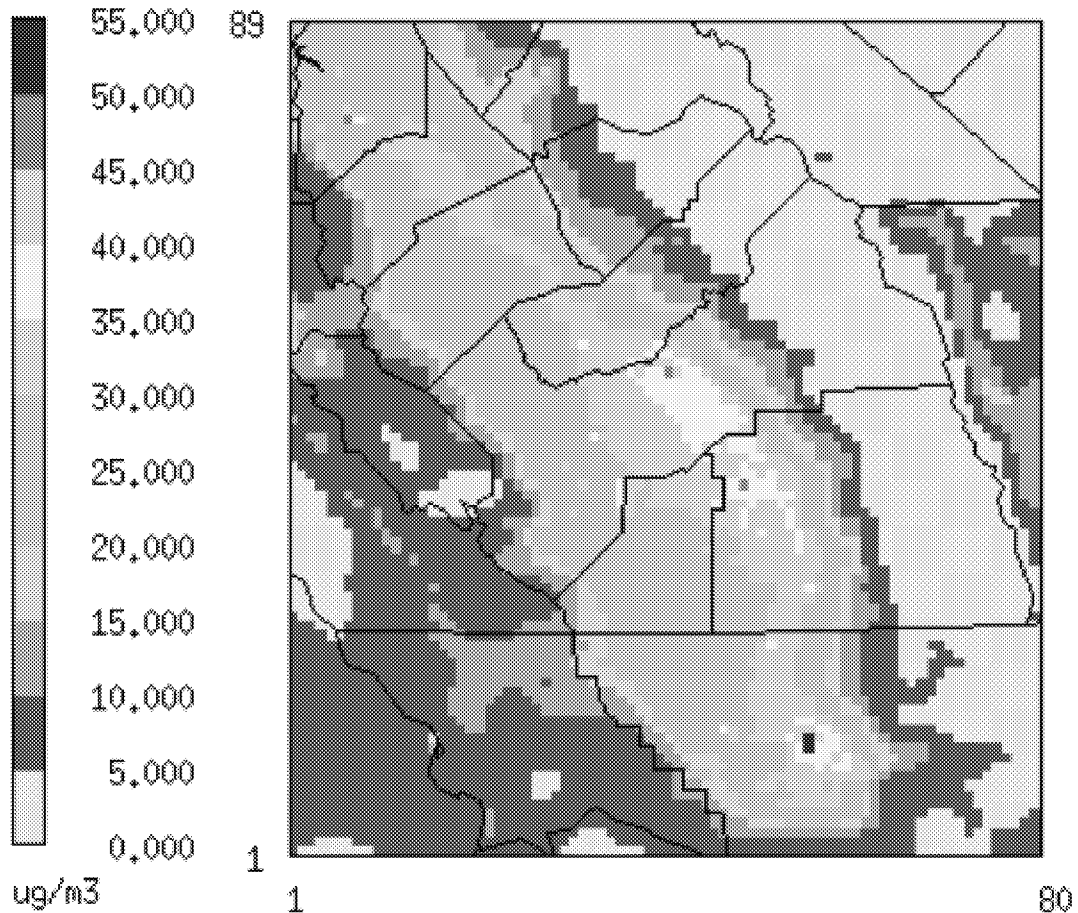
The Plan contains no speciated 24-hour PM_{2.5} data. It contains only annual data and, in one case, monthly data (in Appendix H) are provided.

Three types of information were used to evaluate model performance: maps with PM_{2.5} spatial patterns, performance statistics at individual monitors, and time series plots.

Filled concentration contour plots of the modeling domain are shown in RMPA, pp. 7-11 (figures 3 – 7), for annual PM_{2.5} and four quarterly averages. Each of these has seven plots, one each for total PM_{2.5}, nitrate, sulfate, ammonium, organic carbon, elemental carbon, and dust. (An example is included below and shows fourth quarter total PM_{2.5}.) A paragraph on RMPA p. 6 summarizes the plots, noting that nitrate formation follows the pattern expected from seasonal temperature and humidity, although third quarter nitrates appear too high. Sulfates are low for all quarters, while organic carbon (OC) and elemental carbon (EC) are higher in the first and fourth quarters, presumably due to enhanced wood burning during these periods. There is no discussion of the spatial variation of PM_{2.5} or its components and how it compares to expectations or to monitored values.

Fourth Quarter Average Concentrations for PM_{2.5}

2000 - Quarter 4



January -805,-3 0:00:00

Min= 0,881 at (51,76), Max= 52,046 at (56,12)

Source: 2008 PM_{2.5} Plan Appendix "Regional Model Performance Analysis," Figure 7, p.11.

Next the RMPA at pp. 12 - 14 discusses statistics for Mean Fractional Error (MFE) and Mean Fractional Bias (MFB), which are shown in the form of bugle plots. Each plot is for annual average PM_{2.5} total or a component, and shows MFE or MFB plotted against concentration. CARB modeling supplement (pp. 24 - 31) shows additional bugle plots, for each calendar quarter and each chemical species component of PM_{2.5} performance criteria were set at $MFE \leq 75$ percent and $|MFB| \leq 60$ percent. The RMPA notes that the criteria are met for all species except dust, which is substantially overestimated for reasons that are not understood. Eight other statistics are mentioned in the modeling protocol, at p. F-62, such as Mean Normalized Gross Error, but no values are presented.

Finally, time series plots are examined at RMPA pp. 14-16. Bakersfield and Fresno concentrations of PM_{2.5} total and components are plotted against day of the year-long simulation,

with a fluctuating line showing model prediction, and individual dots showing monitored values. CARB modeling supplement (pp. 32 – 65) shows additional time series plots showing all days of the simulation, for each of the 35 monitors, for each chemical species component of PM_{2.5}; it also has combined bar & line graphs of the monthly average species components (pp. 66 - 99). The RMPA notes that the over-predicted of nitrate in the third quarter is apparent, as is the overestimation of dust. The CARB modeling supplement states that the cause of this is over-estimation of specific humidity in the meteorological model in the summer (p. 23) EPA examination of the plots also suggests that many PM_{2.5} days are missed at both Bakersfield and Fresno, that organic carbon is under predicted (especially at Fresno), and that ammonium is under predicted. Sulfate is also often under predicted, but sulfate's contribution to PM_{2.5} levels in the Valley is small. Since the plots show the entire year, it is hard to judge performance during particular months or seasons.

No tables of numbers calculated for the performance statistics are presented, but the many bugle graphs give an excellent idea of performance for Mean Fractional Error and Mean Fractional Bias, including comparison to performance goals.

Sensitivity, or diagnostic testing of the model, can check whether it responds to input changes in a physically reasonable way, whether alternative input assumptions could have improved model performance, and whether the predictions are subject to compensating errors in the inputs. These are discussed only briefly, in the CARB modeling supplement, p. 23, which mentions numerous simulations performed to assure the credibility of the simulation; these included changing boundary and initial conditions, varying lengths of time for initial model “spin up”, and other tests. There is little discussion of qualitative assessment of whether the model is adequately capturing the various processes leading to high PM_{2.5} concentration and no assessment of spatial variation of model performance, but it is apparent that substantial effort went into evaluating the reasonableness of the simulation.

EPA finds the air quality model performance is adequate, and adequately documented, though additional qualitative description of how the model is capture important phenomena would have been desirable.

k. Modeled Attainment Test

A *modeled attainment test* is an exercise in which an air quality model is used to simulate current and future air quality. If future estimates PM_{2.5} concentrations are less than the NAAQS, then this element of the attainment test is satisfied. EPA's recommended test is one in which model estimates are used in a relative rather than absolute sense. That is, we take the ratio of the model's future to current (baseline) predictions at monitors. We call these ratios, *relative response factors*, RRF. Future PM_{2.5} concentrations are estimated at existing monitoring sites by multiplying a modeled relative response factor at locations near each monitor by the observation-based, monitor-specific, baseline design value. The resulting predicted future concentrations are compared to NAAQS.

The PM_{2.5} attainment test reflects the fact that PM_{2.5} is a mixture. In the test, ambient PM_{2.5} is divided into major species components, so EPA's test is called the Speciated Modeled Attainment Test (SMAT). These are mass associated with sulfates, nitrates, ammonium, organic carbon, elemental carbon, particle bound water, other primary inorganic particulate matter, and passively collected mass. Note that FRM monitors do not measure the same components and do

not retain all of the PM_{2.5} that is measured by routine speciation samplers and therefore cannot be directly compared to speciation measurements from the STN. By design, the FRM mass measurement does not retain all ammonium nitrate and other semi-volatile materials (negative sampling artifacts) and includes particle bound water associated with sulfates, nitrates and other hygroscopic species (positive sampling artifacts). This results in concentrations (and percent contributions to PM_{2.5} mass) which may be different than the ambient levels of some PM_{2.5} chemical constituents. Therefore we recommend a SMAT technique which uses an FRM mass construction methodology which results in reduced nitrates (relative to the amount measured by routine speciation networks), higher mass associated with sulfates and nitrates (reflecting water included in gravimetric FRM measurements) and a measure of organic carbonaceous mass which is derived from the difference between measured PM_{2.5} and its non-organic carbon components. This approach is sometimes called SANDWICH, for sulfate, addjusted nitrate, derived water, inferrred carbonaceous material balance approach. Guidance, p. 47.

A separate RRF is calculated for each of the PM_{2.5} components (except passive mass). We call each of these site-specific ratios, a component-specific RRF. Future PM_{2.5} design values are estimated at existing monitoring sites by multiplying modeled relative response factors near each monitor times the observed component specific design value. This latter quantity is estimated using measured site-specific design values for PM_{2.5} in concert with available measured composition data. Future site-specific PM_{2.5} design values at a site are estimated by adding the future year values of the seven PM_{2.5} components. If all future site-specific PM_{2.5} design values are less than or equal to the concentration specified in the NAAQS, the test is passed. Guidance, pp. 15-16.

2008 PM_{2.5} Plan's annual PM_{2.5} NAAQS attainment test is discussed in Chapter 3, pp. 3-20 and 2-33, and in Appendix G on "Regional Air Quality Modeling". Sections 4 and 5 of the CARB modeling supplement provides additional information on SMAT and on the development of the RRFs.

A variation on EPA's SMAT approach is used, to account for the SJV's abundance of ammonia and the dominance of ammonium nitrate over ammonium sulfate. This variation is to assume that ammonium on the monitor filter is the measured STN NH₄ minus any losses associated with fully neutralized nitrate (as NH₄NO₃) that may have volatilized off the FRM filter. 2008 PM_{2.5} Plan, p. G-10. Sections 4 and 5 of the CARB modeling supplement (pp. 100 – 103) provide additional justification for the approach, with graphical comparisons showing that measured ammonium is equal to the amount needed to neutralize measured nitrate and sulfate.

The 2006 design values and the results of the SMAT for 2014 baseline conditions and for the result of new emissions controls are shown in Chapter 3, Table 3-3 (p. 3-23) and Appendix G, Table 3 (p. G-21) of the 2008 PM_{2.5} Plan. The 2014 controlled design value is seen to be less than the annual NAAQS level of 15 µg/m³ for every monitor, thus demonstrating attainment. The highest 2014 value is 14.7 µg/m³ at the Bakersfield Planz Road monitor. The RRFs, and details of their calculation are presented in section 5 of the CARB modeling supplement, pp. 103 - 104, and RRF tables at pp. 104 -115.

2008 PM_{2.5} Plan's 24-hour PM_{2.5} NAAQS attainment test is discussed in the same place as the attainment test for the annual standard, with results in Appendix G, Table 4, p. G-22.

Appendix G, Table 4 shows the 2006 design values for Bakersfield and Fresno monitors and the projected 2014 design values for the controlled case. Since the 2006 design values are

already below the 1997 24-hr NAAQS level of 65 µg/m³, the controlled values are, too. The highest 2014 value is 46.2 µg/m³ at the Bakersfield California Avenue monitor. The Relative Reduction Factors are presented in section 5 of the CARB modeling supplement, at pp. 117 - 138.

The attainment tests show attainment of both PM_{2.5} NAAQS. The Plan cites several factors as justifying a variation on EPA's SMAT approach (e.g., the prevalence of ammonia, the dominance of ammonium nitrate, the effect of substantial controls on fugitive dust and direct carbon emissions (p. G-10 and p. 3-20)) and the CARB modeling supplement shows the approach is reasonable for the ammonium ion. The RRFs are presented for each monitoring station and calendar quarter. EPA finds the attainment demonstration is adequately documented, and that it projects attainment by 2014 for both the annual and 24-hour PM_{2.5} NAAQS.

1. Unmonitored Area Analysis

In addition to a modeled attainment demonstration, EPA recommends use of an unmonitored area analysis. This type of analysis is intended to ensure that a control strategy leads to reductions in ozone or PM_{2.5} at other locations which could have baseline (and future) design values exceeding the NAAQS were a monitor deployed there.

The unmonitored area analysis should identify areas where future year design values are predicted to be greater than the NAAQS. The unmonitored area analysis for a particular nonattainment area is intended to address potential problems within or near that nonattainment area. The analysis should include, at a minimum, all nonattainment counties and counties surrounding the nonattainment area (located within the state). In order to examine unmonitored areas in all portions of the domain, EPA recommends that a state use interpolated spatial fields of ambient data combined with gridded modeled outputs. Guidance, p. 29.

Gradient adjusted spatial fields are first created for the base year. Future year estimates can then be created by applying gridded RRFs to the gradient adjusted spatial fields. The basic steps are as follows (Guidance, p. 30):

1. Interpolate base year ambient data to create a set of spatial fields.
2. Adjust the spatial fields using gridded model output gradients (base year values).
3. Apply gridded model RRFs to the gradient adjusted spatial fields.
4. Determine if any unmonitored areas are predicted to exceed the NAAQS in the future.

2008 PM_{2.5} Plan's unmonitored area analysis is discussed on page G-15. It takes the form of a simple screening analysis, examination of a filled concentration contour plot (Figure 3 on p. G-20), and the observation that "there are no areas with steep gradients that would result in higher design values than those measured at monitors".

In addition, section 6 of the CARB modeling supplement (pp. 139 - 182) contains an Unmonitored Area Analysis in the sense of the EPA Guidance, using EPA's Model Attainment Test Software (MATS). It includes spatial contour plots of quarterly and annual average concentrations for simulated PM_{2.5} components for the 2005 base year (pp. 141 - 147), and comparable plots for the 2014 attainment year, including concentrations adjusted by the gridded model output gradients from MATS. CARB examined locations where the gradient implied high values. In one case, Modesto 14th Street, the location already had a monitor, and modeled results

there, and so did not strictly speaking need to pass the test. MATS and direct modeled results for the Bakersfield area appear to match, so CARB believes MATS results are reliable for that area, and MATS did not predict any unmonitored violation. For the Fresno area, there appeared to be a 15-25 percent overestimate by MATS, based on 2005 measured values; discounting the MATS future high value in an unmonitored location west of Fresno by that amount led CARB to believe that this area, too, will not have an unmonitored PM_{2.5} NAAQS violation.

EPA finds that CARB has shown that SJV successfully passes the test in the Unmonitored Area Analysis.

m. Weight of Evidence

States should perform complementary analyses of air quality, emissions and meteorological data and consider modeling outputs other than the results of the attainment test. Such analyses are instrumental in guiding the conduct of an air quality modeling application. The results of corroboratory analyses may sometimes be used in a *weight of evidence determination* to show that attainment is likely despite modeled results which may be inconclusive. The further the attainment test is from being passed, the more compelling contrary evidence produced by corroboratory analyses must be to draw a conclusion differing from that implied by the modeled attainment test results. Guidance, p. 17. Supplemental analyses could include additional modeling using alternative models and inputs, modeling apportionment and process analysis tools, alternative metrics (such as change in the number of grid cells above the NAAQS), trends in ambient air quality, trends in emissions, receptor modeling, and indicator species approaches.

2008 PM_{2.5} Plan's weight of evidence determination is discussed in Appendix H. Supplemental analyses used in the weight of evidence determination are described in that Appendix and also in Chapter 3, Appendix F, and the appendix on "Receptor Modeling Documentation" (hereafter RMD).

As mentioned near the start of this TSD section on modeling, the Plan emphasizes a receptor modeling-based approach for the attainment demonstration, with photochemical modeling added later. However, EPA views the receptor modeling mainly as a supplemental analysis to corroborate the photochemical modeling as part of the weight of evidence determination.

Chapter 3 describes three variants of a speciated rollback approach (p. 3-23). Method 1 is based on Chemical Mass Balance (CMB) modeling of PM₁₀ speciated measurements from the year 2000; this was converted to 2005 PM_{2.5} values, which are in turn projected to 2014, with some adjustments described below. This method is applied to the Fresno, Kern, Kings, and Tulare County monitors. Method 2 is similar but is based on speciation data from the years 2004-2006. This method is applied to the Fresno and Kern monitors only. The third method is based on a Positive Matrix Factorization (PMF) using speciated data from the years 2003-2006. This method is applied to the Fresno and Kern monitors only. Thus Fresno and Kern County monitors have all three methods applied, Kings and Tulare Counties have only Method 1 applied.

Table B-1 Guidelines For Weight of Evidence Determinations		
Results of Modeled Attainment Test		Supplemental Analyses
Annual PM_{2.5}	24-Hour PM_{2.5}	
Future Design Value < 14.5 $\mu\text{g}/\text{m}^3$, all monitor sites	Future Design Value < 62 $\mu\text{g}/\text{m}^3$, all monitor sites	Basic supplemental analyses should be completed to confirm the outcome of the modeled attainment test
Future Design Value 14.5-15.5 $\mu\text{g}/\text{m}^3$, at one or more sites/grid cells	Future Design Value 62-67 $\mu\text{g}/\text{m}^3$, at one or more sites/grid cells	A weight of evidence demonstration should be conducted to determine if aggregate supplemental analyses support the modeled attainment test
Future Design Value > 15.5 $\mu\text{g}/\text{m}^3$, at one or more sites/grid cells	Future Design Value > 68 $\mu\text{g}/\text{m}^3$, at one or more sites/grid cells	More qualitative results are less likely to support a conclusion differing from the outcome of the modeled attainment test.

All three of these approaches included various adjustments and projection to 2014 (and in some cases intermediate years). The adjustments included consideration of the emissions inventory in order to attribute PM_{2.5} in a more refined way than the CMB and PMF approaches could by themselves, as the latter cannot always distinguish between different sources of a given chemical species. There is little text discussion in the Plan of how this refinement was done. Adjustments are also made considering the area of influence of each monitor in order to further refine which sources were relevant to particular monitors. There is no text definition of area of influence and no discussion of the procedure followed, other than a diagram and formula at RMD, p. 79, though the meaning of this diagram and formula is not clear. Another adjustment involved modeled sensitivity factors from CMAQ nitrate modeling (and linear nitrate projection and IMS95 modeling”) were used to estimate the response of the atmosphere to changes in NO_x emissions. This was an attempt to address the inability of straight speciated rollback to handle secondary particulates, as they are not directly associated with emitted species from sources. It is not clear exactly to which modeling exercises these refer. In addition there is discussion of variations on SMAT (p. 3-21), involving “approved alternate linear assumptions” on trapped water bonded to ammonium nitrate and ammonium sulfate and other issues, but it is not clear how this was done. The execution of much of this is in the spreadsheet in the RMD; however, there is very little documentation on the spreadsheet and its formulas. The results from all these adjustments are in Table 3-2, p. 3-22, which lists for each county the 2005 design value, “Receptor Modeled SMAT RRF 2005-2014” based on the methods just described, and a projected 2014 design value. For all counties the value is less than 15 $\mu\text{g}/\text{m}^3$ the level of the

annual NAAQS. The highest 2014 value is 14.09 $\mu\text{g}/\text{m}^3$, for Kern County based on the PMF method.

EPA finds that the ideas used to refine the receptor modeling results are reasonable ways to address shortcomings of receptor modeling, especially for an area for which secondary particulates are so important. The results do support the attainment demonstration, and it is apparent that substantial thought and effort went into applying the methods. However, documentation for the approaches used is confusing, not well organized, and in some cases missing altogether. Without improved documentation, it is difficult to assess the strength of this supplemental analysis.

Appendix H. "Weight of Evidence" describes several other supplemental analyses. These include tables (pp. H-5 - H-4), bar charts (p. H-5), a Theil regression trend test (p. H-5) and time series plots (p. H-6 and p. H-10), all showing a downward trend in 24-hour and annual PM_{2.5} concentrations. Monthly time series (pp. H-7 – H-8) comparing 2001 to 2006 for Bakersfield and Fresno show substantial decline in PM_{2.5} during the winter months (summers remained about the same). Histograms (p. H-9) comparing frequency distributions for various concentration ranges from the years 1999-2001 to those in 2004-2006 for Bakersfield and Fresno show decreases in the frequency of the highest concentrations. This decrease is clearest for Fresno, which also shows increased occurrence of low concentrations. (Mid-range concentrations, between 15 and 40 $\mu\text{g}/\text{m}^3$ are more of a mixed picture.) Species and total PM_{2.5} trends (pp. H-14 – H-15) also show declines over 2001-2006, principally in carbonaceous aerosols, but also in ammonium nitrate. The increased stringency of the Residential Wood Combustion Rule that was implemented in 2003 is cited as one of the causes of the decline (p. H-14). Further evidence of a downward trend in nitrate during 1987-2005 is shown in additional graphs (p. H-17).

Emissions are also trending down, as seen in a 2001-2005 time series plot for emitted species, especially for NO_x and for reactive organic gases.

An indicator species analysis plots the Angiola and Fresno winter 2000-2001 concentrations of NH₃ (ammonia) against that of HNO₃ (nitric acid). It is the combination of these two that forms ammonium nitrate PM_{2.5}. Ammonia concentrations are almost always far higher than those of nitric acid, and also vary over a much larger range than nitric acid. This is evidence that nitric acid is the limiting precursor, with some implications for the advisability of controls of NO_x emissions as opposed to ammonia.

Finally, Appendix H (p. H-25) discusses the receptor modeling and photochemical modeling results already covered above.

EPA finds that the supplemental analyses presented in Appendix H are useful in a weight of evidence, and support the demonstration of attainment.

3. Conclusions

The 2008 PM_{2.5} Plan with the CARB modeling supplement adequately documents all the elements of a modeled attainment demonstration. Significant time, money, and effort by CARB, the District, and many others have gone into preparing the air quality modeling to support the attainment demonstration in SJV PM_{2.5} plan for the San Joaquin Valley, including the multi-million dollar CRPAQS study. EPA finds that the modeling is sound and provides an adequate

basis for the reasonably available control measures, reasonable further progress, and attainment demonstrations in the Plan.

During the comment period on our 2011 proposal, we received a number of comments objecting to our proposed conclusion that the air quality modeling in the SJV 2008 PM_{2.5} SIP provides an adequate basis for the various demonstrations in the SIP. After reviewing these comments, we continue to find that the air quality modeling is adequate for SIP purposes. We summarize and respond to these comments in section III.C. of this TSD.

4. Pollutant Ratios Used to Determine PM_{2.5} Equivalency

The 2011 Progress Report and the SJV PM_{2.5} Progress Report use a PM_{2.5} equivalency metric in a number of tables and demonstrations. Two ratios are used:

- 9 tpd NO_x to 1 tpd direct PM_{2.5}
- 1 tpd SO_x to 1 tpd direct PM_{2.5}

The NO_x:PM_{2.5} ratio is partly documented in supplemental information provided by CARB, entitled “Precursor Effectiveness,” which is available in the docket for this rule. Using the CMAQ modeling application used for the attainment demonstration, in two separate runs CARB simulated an additional 10 percent reduction in modeling domain NO_x emissions and in direct PM_{2.5} emissions. These PM_{2.5} effects were divided by the (unstated) emissions totals for each pollutant, to give a concentration per emissions change, or effectiveness for each pollutant, and finally the direct PM_{2.5} effectiveness was divided by the NO_x effectiveness to arrive at a NO_x:PM_{2.5} ratio for each monitor; the average of these is about 9. This method appears to be adequate for purposes of assessing the effect of area-wide emissions changes, such as are used in RFP, contingency measures, and conformity budgets.¹⁴ The method modeled “across the board” emission changes over the entire modeling domain; emissions considered in transportation conformity are also domain-wide. Trading in other contexts could involve additional consideration of spatial and temporal variation of the emissions and would require an additional technical demonstration by the State and evaluation by EPA. EPA is not approving the trading ratio for any other purpose than for transportation conformity.

The approach used by the District to estimate interpollutant equivalency ratios rests on the faulty assumption that ambient sensitivity to emissions reductions of a given precursor can be estimated as the ratio of concentration to emissions. This is the assumption of linear “rollback”,

¹⁴ EPA is approving the use of this NO_x to PM_{2.5} interpollutant trading ratio to meet CAA planning requirements for the 1997 PM_{2.5} standards in the SJV. EPA is approving the use of this ratio in transportation conformity determinations for the 2006 24-hour PM_{2.5} NAAQS but only until such time EPA finds adequate or approves budgets developed specifically for the 2006 standard. EPA is not approving the use of this ratio in plans for future PM standards or in the District’s new source review (NSR) permitting program.

The District recently submitted revisions to its NSR rule, Rule 2201, which require that interpollutant trading ratios used for purposes of satisfying PM_{2.5} NSR offset requirements first be approved by EPA into the SIP. See Rule 2201 (April 21, 2011), section 4.13.3.2. The Rule 2201 submittal also states that the District intends to submit SJV-specific PM_{2.5} interpollutant trading ratios for EPA’s approval in a future SIP revision but will, in the interim, require project proponents to use the default ratios provided in the preamble to EPA’s PM_{2.5} NSR rule (73 FR 28321, 28339 (May 16, 2008)), until alternative trading ratios are approved by EPA into the SIP. See SJVAPCD, Final Draft Staff Report, Proposed Amendments to Rule 2201 (New And Modified Stationary Source Review Rule), March 17, 2011, p. 4.

and inherently cannot address the complexities of PM_{2.5} formation chemistry, which is nonlinear. It is in contrast to the State's approach for the NO_x: PM_{2.5} ratio which used photochemical modeling results to take into account such nonlinearity. Even if the ambient PM_{2.5} response to precursor reductions is in fact linear for a range of emissions reductions, that response does not necessarily match the average response assumed in rollback. (Similarly, the slope of a curve at a given point does not necessarily match the slope of the line connecting the curve's end points.) Ambient concentration might be very responsive initially and less responsive with greater reductions, or vice versa; both would appear as the same responsiveness under the faulty linear rollback assumption.

Some strengths of the District's methodology are that it attempts to account for multiple monitors, the portion of each monitor's ambient concentration that is likely subject to local controls, the emissions that are in the monitor's area of influence and have the strongest affect on its concentration, and the time of year (4th quarter of the years) having the highest emissions and concentrations. *See* Ratio Documentation p.1; Ratio spreadsheet; and SJVAPCD May 2009 letter, attachment II pp. 4, 8.¹⁵ In addition, it makes use of information on the contribution of broad source categories to particular locations, which were available at the time from the receptor modeling approach, and not from the photochemical modeling. SJVAPCD May 2009 letter, attachment II, p. 6, 9. Finally, the District did try to assess how results might change during the 2005-2014 period. SJVAPCD May 2009 letter, attachment II, p. 8. These positive features are improvements within the confines of the receptor modeling approach, but they cannot compensate for the faulty underlying assumption discussed above.

Two other potential problems in the approach are worth noting. First, the sensitivity to direct PM_{2.5} emissions is based on organic carbon (OC), partly because OC is the main pollutant for which interpollutant offsets are sought in the context of New Source Review permitting in the SJV. SJVAPCD May 2009 letter, attachment II, p.2). It is not clear whether this is the appropriate basis for evaluating equivalency for air quality planning purposes including contingency measures, and whether the sensitivity to other types of direct PM_{2.5} emissions would result in different ratios. Second, it is not clear what emission level to use in the concentration per emissions sensitivity ratio. For SO_x, the District uses 2.97 tpy, the average of the 1.337 and 4.598 tpy for the "12-Ke" and "Kern" areas of influence, respectively. *See* ratio spreadsheet. The average may be reasonable to use within the confines of the approach, but for a given set of conditions, either of the two tons/year ratios might be more appropriate, with the result that the sensitivity, and the overall interpollutant ratio, could vary by a factor of about 3.5. It is not clear how any of these ratios relates to actual sensitivity of ambient PM_{2.5} to emissions changes.

EPA does not find that the approach used by CARB and the District to develop the SO_x:PM_{2.5} ratio is adequate for determining interpollutant equivalency ratios and is not approving its use for any SIP purposes. This issue would be better explored with a photochemical model.

¹⁵ *See* document "Atmospheric Interpollutant Equivalency between Direct Particulate Emissions and Secondary Particulate Formed from Gaseous Sulfur Oxide Emissions" (SJV SO_x PM_{2.5} ratio final2.doc), spreadsheet "Interpollutant Calculation" (SJV SO_x PM_{2.5} ratio.xls), and letter from David Warner, San Joaquin Valley Air Pollution Control District to Mr. Joseph Douglas, California Energy Commission, May 27, 2009, Attachment II, "Interpollutant Offset Ratio Explanation" (SJVAPCD_AEP_IP_Ratio_20090527.pdf).

During the comment period on our 2011 proposal, we received a number of comments objecting to allowing the use of interpollutant trading for any purpose. After reviewing these comments, we continue to find that the limited use of the 9:1 NO_x to PM_{2.5} interpollutant trading ratio is approvable for transportation conformity purposes. We summarize and respond to these comments in section III.D. of this TSD.

5. Effect of Inventory Changes on the Air Quality Modeling and Attainment Demonstrations

As discussed above in section V.A., CARB has recently updated the inventories for several mobile source categories for both the base and future years as well as revised the economic forecasts on which the future inventories were based. Ideally, new attainment demonstration modeling would be performed to evaluate the effect of these updates and revisions; however, remodeling is a substantial undertaking and would not necessarily change the basic conclusions of the existing attainment demonstration analysis.

Relative to emissions in the Plan, the decreases in the base year 2005 emissions inventory due to the inventory updates are about 6 percent for NO_x and 5 percent for direct PM_{2.5} emissions; the 2014 attainment year target emissions levels are unchanged. *See* Table B-2. Emissions decreases in the base year tend to reduce the relative effect of controls and increase the projected PM_{2.5} concentrations in the attainment year. We now know that base year emissions estimates were slightly too high, yet the model matched the observed concentrations in that year. With those higher emissions, the base year modeling should have predicted higher concentrations. The model, therefore, has a tendency to predict slightly lower concentrations than it should. To compensate for this model under-prediction, the predicted attainment year concentration should be slightly higher than shown in the Plan. Using model sensitivity results provided by CARB (Table B-3), EPA estimates that predicted ambient concentrations would be higher by only about 2.5 percent due to the emission inventory revisions, and predicted design values still attain the NAAQS. *See* Table B-4. EPA therefore concludes that the attainment demonstration remains valid, despite the emission inventory changes.

During the comment period on our 2011 proposal, we received a number of comments objecting to our proposed conclusions that revisions to the inventory did not invalidate the modeling. After reviewing these comments, we continue to find that the attainment demonstration remains valid. We summarize and respond to these comments in section III.C. of this TSD.

Table B-2 Changes to Base Year and Attainment Year Emissions Levels (tons per annual average day)				
	2005 Base Year		2014 Attainment Year	
	NO _x	Direct PM _{2.5}	NO _x	Direct PM _{2.5}
Unrevised from 2008 Plan	575.4	86.0	291.2	63.3
Revised from Progress Report	540	82	291.2	63.3
Change	-35.4	-4.0	0.0	0.0
Percent change	-6.2%	-4.7%	0.0%	0.0%

Notes:

1. Unrevised 2005 base year emissions from: 2008 PM_{2.5} Plan App. B Table B-3 at p. B-11, and Table B-2 at p.B-7
2. Unrevised 2014 attainment year emissions from: 2008 PM_{2.5} Plan, Table 8-1
3. Revised 2005 base year from: Progress Report supplement, Attachment 1
4. 2014 Progress Report emissions are same as Plan: emission target did not change.

Table B-3 Effect on Modeling of Base Year Emissions Changes								
Site	Plan Modeled 2014 Design Value	2014 DV with 10% Additional Reductions		Concentration Change				Total
				Per % Emission Change		Due to Base Year Emission Changes		
		NO _x	Direct PM _{2.5}	NO _x	Direct PM _{2.5}	NO _x	Direct PM _{2.5}	
Site 1 (Bakersfield-California)	14.3	14.1	13.6	0.02	0.07	-0.12	-0.33	-0.45
Site 2 (Bakersfield-Planz)	14.7	14.6	14	0.01	0.07	-0.06	-0.33	-0.39
Site 3 (Bakersfield-Golden)	14.4	14.2	13.7	0.02	0.07	-0.12	-0.33	-0.45

Notes:

1. Plan modeled design value and design value with additional reductions are from 2011 Progress Report supplement, Attachment 3
2. Total concentration change assumes that changes due to the individual pollutants can be added to get total change; this assumption is acceptable to 1st order

Table B-4 Effect on Attainment Year Design Value of Base Year Emissions Changes					
Site	Measured 2006 Design Value	Fractional Effect on Design Value	Percent effect on Design Value	Plan Modeled 2014 Design Value	Scaled 2014 Design Value
Site 1 (Bakersfield- California)	18.5	1.025	2.5%	14.3	14.7
Site 2 (Bakersfield-Planz)	18.9	1.021	2.1%	14.7	15.0
Site 3 (Bakersfield- Golden)	18.6	1.025	2.5%	14.4	14.8

Notes:

1. Fractional effect of emissions changes revising base year emissions DOWN translates to scaling UP attainment year PM_{2.5}; the measured base year concentration was caused by emissions being lower than previously thought; effect is to make it harder to attain. Fractional effect was calculated as the reciprocal of (2006 DV plus Total emissions change, divided by 2006 DV)
2. Effect would be reversed for emissions revisions in target year, but no effect in this case since target emissions are unchanged.

C. PM_{2.5} Attainment Plan Precursors

1. Requirements for the Control of PM_{2.5} Precursors

EPA recognizes NO_x, SO₂, VOC, and ammonia as the main precursor gases associated with the formation of secondary PM_{2.5} in the ambient air. These gas-phase precursors undergo chemical reactions in the atmosphere to form secondary particulate matter. Formation of secondary PM_{2.5} depends on numerous factors including the concentrations of precursors; the concentrations of other gaseous reactive species; atmospheric conditions including solar radiation, temperature, and relative humidity; and the interactions of precursors with preexisting particles and with cloud or fog droplets. 72 FR 20586, 20589.

As discussed previously, states must include submit emissions inventories for each of the four PM_{2.5} precursor gases in order to assure the information on all pollutants and precursors that contribute to PM_{2.5} concentrations is available. 72 FR 20586, 20589 and 40 CFR § 51.1008(a)(1). However, the overall contribution of different precursors to PM_{2.5} formation, and the effectiveness of alternative potential control measures will vary by location. Thus the precursors a state should regulate for attaining the PM_{2.5} NAAQS will also vary to some extent from area to area. 72 FR 20586, 20589.

In the PM_{2.5} implementation rule, EPA did not make a finding that all potential PM_{2.5} precursors must be controlled in each specific nonattainment area. *See* 72 FR 20586, 20589. Instead, for reasons explained in the rule, a state must evaluate control measures for sources of SO₂ in addition to sources of direct PM_{2.5} in all nonattainment areas. 40 CFR § 51.1002(c) and (c)(1). A state must also evaluate control measures for sources of NO_x unless the state and/or EPA determine that control of NO_x emissions would not significantly reduce PM_{2.5} concentrations in the specific nonattainment area. 40 CFR § 51.1002(c)(2). By contrast, EPA has determined in the PM_{2.5} implementation rule that states do not need to address controls for sources of VOC and ammonia unless the state and/or EPA make a technical demonstration that such controls would significantly contribute to reducing PM_{2.5} concentrations in the nonattainment area. 40 CFR § 51.1002(c)(3) and (4). Such a demonstration is required “if the administrative record related to development of its SIP shows that the presumption is not technically justified for that area.” 40 CFR § 51.1002(c)(5).

Significant contributor in this context means that a significant reduction in emissions of the precursor from sources in the area would be projected to provide a significant reduction in PM_{2.5} concentrations in the nonattainment area. 72 FR 20586, 20590. Although EPA did not establish a quantitative test for determining the significance of such a change, EPA noted that even relatively small reductions in PM_{2.5} levels are estimated to result in worthwhile public health benefits. *Id.*

EPA further explained that a technical demonstration to reverse the presumption for NO_x, VOC, or NH₃ in any area could consider the emissions inventory, speciation data, modeling information, or other special studies such as such as monitoring of additional compounds, receptor modeling, or special monitoring studies. 72 FR 20586, 20596-20597. These factors could indicate that the emissions or ambient concentration contribution of a precursor, or the sensitivity of ambient concentrations to changes in precursor emissions, differs in the specific nonattainment area from the presumption for that precursor in the PM_{2.5} implementation rule.

2. Identification of PM_{2.5} Attainment Plan Precursors in the SJV 2008 PM_{2.5} Plan and EPA's Evaluation

The 2008 PM_{2.5} Plan does not explicitly identify the pollutants that have been selected as PM_{2.5} attainment plan precursors as this term is defined in 40 CFR § 51.1000. The Plan addresses only NO_x and SO₂ in the RFP and attainment demonstrations and the District's RACM/RAC_T analysis and thereby implicitly identifies NO_x and SO₂, but not VOC and ammonia, as attainment plan precursors. It does include supporting documentation for the inclusion of NO_x as an attainment plan precursor and for the exclusion of ammonia. As discussed below, it has conflicting information about the impact of controlling VOC as a precursor for PM_{2.5} attainment. However, supplemental information provided by CARB makes clear that the State does not consider VOC to be a PM_{2.5} attainment plan precursor and provides supporting documentation for that position.

Precursor relationships are discussed in the Plan's "Executive Summary", Chapter 3 "What is Needed to Demonstrate Attainment?", Chapter 7 "Local, State, and Federal Controls", Chapter 8 "Reasonable Further Progress", Appendix F "SJV PM_{2.5} SIP Modeling Protocol", Appendix G "Regional Air Quality Modeling", Appendix J "Comments and Responses", and the additional appendix "2014 Receptor Modeling Documentation" ("RMD"). The most detailed discussion is in Appendix F, p. F-53ff, with the main points repeated in Chapter 3, p. 3-8ff. The RMD presents additional evidence regarding precursors. Finally, supplemental information on VOC is presented in a CARB comment letter on EPA's 2010 proposal. *See* letter, James Goldstene, CARB, to Frances Wicher, EPA, January 31, 2011, attachment 4 (CARB VOC supplement).

As mentioned above, ambient contribution and ambient sensitivity to emissions changes may both be considered in determining whether the presumption for an attainment plan precursor should be reversed. The 2008 PM_{2.5} Plan contains numerous qualitative statements that San Joaquin Valley's ambient PM_{2.5} is dominated by ammonium nitrate (NH₄NO₃), and that NO_x reductions are more effective at reducing ambient PM_{2.5} than reductions in the other precursors. Most of those statements are in Chapter 3 and Appendix F and are based on excerpts of findings from CRPAQS. Several of the excerpted and cited CRPAQS documents are available at CARB's "Central California Air Quality Studies" web site at <http://www.arb.ca.gov/airways>.

For ambient contributions of precursors to the 24-hour PM_{2.5} NAAQS, the Plan contains qualitative descriptions but no quantitative data, although it does refer to "CRPAQS data for the year 2000 is available at the CARB website <http://www.arb.ca.gov/airways>". 2008 PM_{2.5} Plan, p. F-59.

For the annual and 24-hour PM_{2.5} NAAQS, the Plan contains some qualitative description of precursor ambient contribution. For example, it states on p. 2-8 that annual concentrations are driven by wintertime concentrations, and further, that the highest short term concentrations are driven by ammonium nitrate, as found in the CRPAQS:

For most of the sites within the SJV, 50–75% of the annual average PM_{2.5} concentration could be attributed to a high PM_{2.5} period occurring from November to January. at non-urban sites, the elevated PM_{2.5} was driven by secondary NH₄NO₃.¹⁶

There is also quantitative data in Appendix G, Table 2. “Percent Composition Ratio Based on 2000 Average CRPAQS Data” (p. G-21), using measurements from the Speciation Trends Network (STN). The RMD also has projected 2014 species composition in data tables (at RMD pp. 1 - 70) and pie charts (at RMD pp. 71 -28), based on various adjustments to Chemical Mass Balance (CMB) and Positive Matrix Factorization (PMF) modeling results. Ammonium nitrate for 2000 monitored data ranges from 24-36 percent of total PM_{2.5}, and if projected to 2014 ranges from 36-51 percent, confirming the importance of NO_x, one source of nitrate, as a precursor that significantly contributes to annual PM_{2.5} levels in the SJV.

In addition to composition data, ambient sensitivity to emissions changes can also be a consideration in determining which species should be regulated in the SIP for an area as attainment plan precursors. For ammonium nitrate PM_{2.5}, which is formed from both ammonia and NO_x, a key issue is the effectiveness of emissions reductions of either or both precursors at reducing PM_{2.5} concentrations. Among the findings cited by the Plan that address this issue are:

“Particulate NH₄NO₃ concentrations are limited by the rate of HNO₃ formation, rather than by the availability of NH₃”

and

“Comparisons of ammonia and nitric acid concentrations show that ammonia is far more abundant than nitric acid, which indicates that ammonium nitrate formation is limited by the availability of nitric acid, rather than ammonia.... This study's analyses suggest that reductions in NO_x emissions will be more effective in reducing secondary ammonium nitrate aerosol concentrations than reductions in ammonia emissions. Reductions in VOC emissions will reduce secondary organic aerosol concentrations and may reduce ammonium nitrate.... The results indicate ammonium nitrate formation is ultimately controlled by NO_x emission rates and the other species, including VOCs and background ozone, which control the rate of NO_x oxidation in winter, rather than by ammonia emissions.

2008 PM_{2.5} Plan p. 3-10.

These findings are based on the relative amounts of ammonia and nitrate: there is so much ammonia present that even substantial reductions of ammonia emissions would still leave ample ammonia for forming ammonium nitrate. On the other hand, NO_x is scarce (relative to ammonia), so reducing it will reduce ammonium nitrate significantly.

¹⁶ Quote from “Initial Data Analysis of Field Program Measurements,” DRI Document No. 2497, July 29, 2005; Judith C. Chow, L.W. Antony Chen, Douglas H. Lowenthal, Prakash Doraiswamy, Kihong Park, Steven D. Kohl, Dana L. Trimble, John G. Watson, Desert Research Institute.

Finally, sensitivity results from photochemical modeling were used in conjunction with the CMB results mentioned above, though it is not clear which particular modeling was used. The 2008 PM_{2.5} Plan states at p. 3-15:

The first regional assessment used the Urban Airshed Model, modified to address aerosol chemistry (UAM-AERO). This assessment used the IMS-95 dataset (an early component of CRPAQS) to evaluate a monitored event of nitrate particulate formation. Regional modeling was also conducted for the later 2000-2001 CRPAQS data, providing an update to the PM₁₀ receptor modeling projections in 2006. A third round of regional modeling with the Community Multiscale Air Quality (CMAQ) model has been completed by CARB.... If this provides a different regional photochemistry analysis for nitrate formation, the receptor modeling estimates for nitrates will be reviewed.

The RMD section on “Review of control strategy effectiveness supported by CMAQ nitrate particulate evaluation” shows the projected result of a 50 percent reduction in NO_x emissions on the annual PM_{2.5} concentration and on PM_{2.5} concentrations in shorter episodes in several seasons. For the annual concentration, the NO_x reduction gave a predicted 5 µg/m³ PM_{2.5} reduction, while for the winter episode the predicted reduction was 28 µg/m³ for the 24-hour period RMD, p. 80. A similar evaluation is also done for to analyze the effect of a 50 percent reduction in ammonia emissions: the corresponding PM_{2.5} predicted reductions for annual and winter were only 0.1 µg/m³ and 0.3 µg/m³, respectively. *See* RMD, p. 81. When compared to the annual and 24-hour NAAQS of 15 and 65 µg/m³, respectively, the effect of NO_x reductions appear to be significant while the effect of ammonia reductions do not. Thus the data and modeling results presented in the 2008 PM_{2.5} Plan, as well as the results of the cited studies, support the identification of NO_x as an attainment plan precursor, and the exclusion of ammonia, consistent with the EPA presumption in the PM_{2.5} implementation rule.

As to VOC, EPA presumption in the PM_{2.5} implementation rule is that VOC need not be an attainment plan precursor. *See* 40 CFR § 51.1002(c)(3). As explained in the preamble to the rule, however, this presumption may not be technically justified for a particular nonattainment area, *i.e.*, this presumption may be incorrect where emissions of VOC significantly contribute to PM_{2.5} concentrations in the nonattainment area. 72 FR 20586, 20590-93, 20596-97. States or EPA may conduct a technical demonstration to reverse the presumptive exclusion of VOC as a PM_{2.5} attainment plan precursor based on the weight of evidence of available technical and scientific information. *Id.*

The 2008 PM_{2.5} Plan contains conflicting information on whether, for the SJV nonattainment area, VOC should be considered as a potential PM_{2.5} attainment plan precursor. Several passages suggest that it should be. On an annual basis, Table 2 in Appendix G (p. G-21) gives an organic carbon range of 38-49 percent of the total PM_{2.5}. This organic PM_{2.5} can be further divided into vegetative burning (9-19 percent of total annual PM_{2.5}), direct VOC PM_{2.5} emissions (also 9-19 percent of total annual PM_{2.5}), and secondary organic aerosols (2-5 percent of total annual PM_{2.5}). RMD, p. 19. This SOA contribution to overall PM_{2.5} levels appears to be non-negligible.

The Plan states: “Secondary organic aerosols (SOA) contribute to a significant fraction of PM_{2.5}. SOA is organic carbon particulate formed in the photochemical oxidation of

anthropogenic and biogenic VOC precursor gases. Aromatic compounds are believed to be efficient SOA producers contributing to this secondary particulate.” 2008 PM_{2.5} Plan, p.3-8. On a 24-hour episodic basis, the contribution of SOA could be higher than the annual 2-5 percent, though it is likely lower for the winter episodes of most concern in the SJV, due to decreased photochemical activity when fog and clouds partially block sunlight. The chemistry of SOA is less well understood than the chemistry of other chemical species, so overall these considerations are not enough to overcome the negative presumption for VOC.

But as noted in the preamble to the PM_{2.5} implementation rule at pp. 20592 - 20593, the lightest organic molecules can participate in atmospheric chemistry processes resulting in the formation of ozone and certain free radical compounds (such as the hydroxyl radical [OH]) which in turn participate in oxidation reactions to form secondary organic aerosols, sulfates, and nitrates. That is, VOC may be a PM_{2.5} precursor not just via formation of SOA, but also via its participation in the oxidant chemistry that leads to nitrate formation, a necessary step in the formation of ammonium nitrate PM_{2.5}. NO_x emissions must be oxidized to nitric acid (HNO₃) before they form particulate ammonium nitrate. Two pathways for this to occur are 1) daytime oxidation by OH, which VOC radicals help create, and 2) nighttime oxidation by ozone, with N₂O₅ as an intermediary.¹⁷

The discussion in the 2008 PM_{2.5} Plan regarding ammonium nitrate (at p. 3-10, quoted above) also refers to VOC, which is identified as one of the controlling factors in NO_x oxidation, the key process in the formation of nitrate and then ammonium nitrate PM_{2.5}. The Plan also stated: “Relatively low non-methane organic compounds (NMOC)/NO_x ratios indicate the daytime photochemistry is VOC, sunlight, and background-ozone limited in winter.” *Id.* If nitrate formation is VOC-limited under some circumstances, then VOC emissions reductions could lead to ambient PM_{2.5} reductions.

Finally, the RMD at page 82 contains sensitivity analyses for VOC, similar to the ones described above for NO_x and ammonia. According to the sensitivity analysis, the effect of a 50 percent reduction in VOC emissions was predicted reductions in PM_{2.5} levels of 1.3 µg/m³ for on annual basis, and 8.7 µg/m³ for the (24-hour) winter episode. When compared to the annual PM_{2.5} NAAQS of 15 µg/m³ and the 1997 24-hour NAAQS of 65 µg/m³, these projected reductions appear significant. The RMD concludes with “Finding: VOC reduction is effective for the annual standard and the winter episode for reduction of total carbon secondary particulates.” In addition, NO_x and VOC reductions may have a synergistic effect, such that the ambient PM_{2.5} benefit would be more than expected from looking at the pollutants individually. We note that this effect could be explored with the CMAQ model, but the hybrid CMB-CMAQ approach used in the 2008 PM_{2.5} Plan would not be suitable for such evaluations.

Despite the above portions of the Plan implicating VOC as an attainment plan precursor, the Plan also contains statements explicitly rejecting that position. In response to comments on the VOC issue made during the District public comment period, the Plan stated: “ARB modeling has shown that VOC reductions are not as effective in reducing secondary PM_{2.5} as NO_x or SO₂ reductions,” and “[a]ll of the technical evaluations for CRPAQS and prior assessments of regional particulate models have indicated that NO_x is the dominant factor and VOC and ammonia are not.” 2008 PM_{2.5} Plan, pp.J-9 and p. J-19. These statements do not cite the specific

¹⁷ Lurmann, F. *et. al.*, 2006, *op cit.*, p. 1688.

modeling and technical evaluations they are based on, but do reflect the District's conclusion after completing the analyses in the Plan, namely that VOC should not be considered an attainment plan precursor. Supplemental information provided by CARB confirmed this conclusion: "VOC emission reductions are ineffective in reducing PM_{2.5} at current ambient concentrations in the San Joaquin Valley... VOC should not be considered a significant PM_{2.5} precursor in this instance". CARB VOC supplement, p.1.

As explained above, although EPA's presumption in the PM_{2.5} implementation rule is that VOC need not be a PM_{2.5} attainment plan precursor, this presumption may not be technically justified for certain nonattainment areas. Indeed, technical information in the 2008 PM_{2.5} Plan strongly suggests that VOC reductions can significantly reduce ambient PM_{2.5} concentrations and contribute to expeditious attainment of the PM_{2.5} NAAQS in the SJV.

The above statements from the PM_{2.5} Plan indicating VOC is a significant precursor may not constitute a technical demonstration sufficient to reverse the PM_{2.5} implementation rule presumption against VOC. Clearly they were not intended as such by the State, in view of various other statements in the Plan. Nevertheless, they are part of the administrative record related to development of the SIP, constitute evidence showing that the VOC presumption may not be technically justified, and indicate that the State should submit a demonstration to either support or reverse the presumption under the PM_{2.5} implementation rule that VOC is not an attainment plan precursor. 40 CFR §51.1002(c)(5).

In view of conflicting statements about VOC in the Plan, and in the absence of a technical demonstration by the State, EPA reviewed the results of several modeling and monitoring studies of the San Joaquin Valley. For this action EPA also reviewed interpretations of these same studies provided in the CARB VOC supplement. Some of the reviewed documents are available on the "Central California Air Quality Studies" web site at www.arb.ca.gov/airways or are cited in the Plan, and are reports from contractors involved in CRPAQS. Others are papers from peer-reviewed journals and are analyses using data from CRPAQS or from the earlier IMS95 study. Four monitoring studies and six modeling studies were found to be relevant to the VOC precursor issue and are discussed further below. The monitoring studies all contain evidence that the VOC pathway for nitrate creation is important at least some of the time but differ on the how important it is relative to other pathways such as the nighttime ozone pathway, and are not conclusive on the efficacy of VOC controls. Unlike the monitoring studies, most of the modeling studies explicitly assessed the relative effectiveness of precursor controls. They generally found that VOC controls could be effective at reducing ambient PM_{2.5} for some times and places, though there were also findings of little benefit or even a disbenefit in some cases.

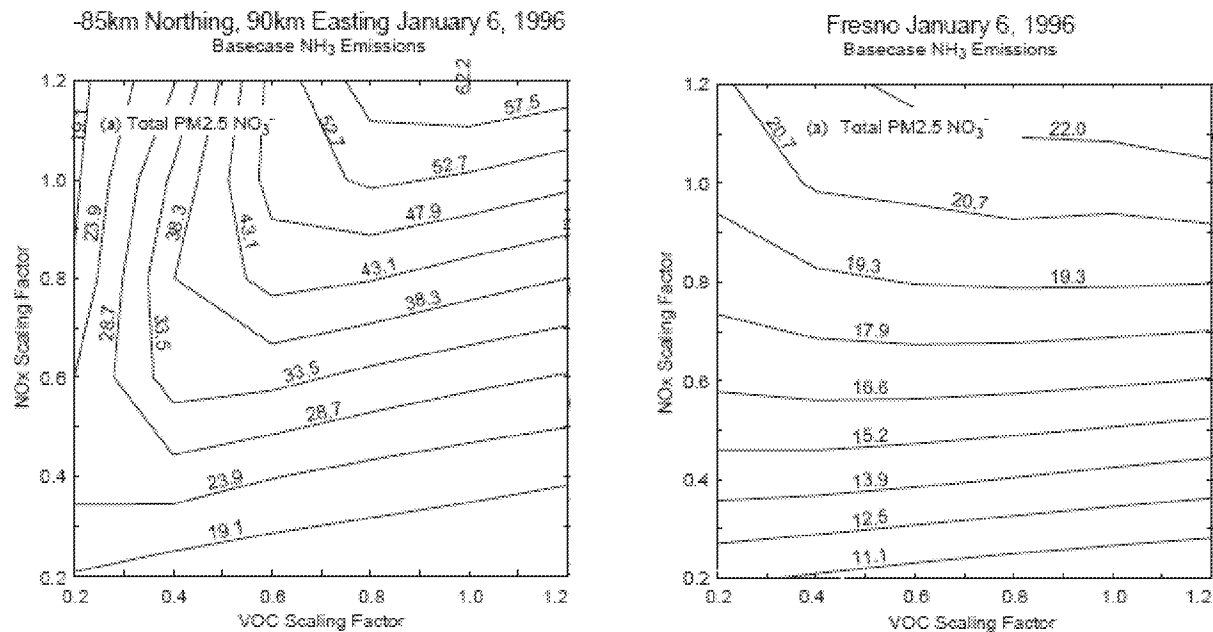
The monitoring studies examined time series of various pollutants annually and during severe winter PM_{2.5} episodes. The monitoring studies were not all aimed at assessing the relative effectiveness of precursor controls, and insofar as they addressed that issue, they focused more on the relative importance of ammonia and NO_x controls, rather than on VOC versus. NO_x controls. They nevertheless do contain some tentative conclusions about VOC. The monitored relative abundances of precursors and other intermediate chemical species can yield information on the chemical processes occurring and their relative importance. For example, nitrate concentrations far below those of ammonia are evidence that the formation of particulate ammonium nitrate is limited by NO_x emissions rather than by ammonia emissions. (Lurmann et. al., 2006). The concentration of nitric acid (HNO₃) relative to peroxides suggests the prevalence of VOC-limited OH and nitrate formation relative to VOC-abundant conditions (Pun, 1998). The

correspondence of daytime ozone and nitrate PM_{2.5} peaks for rural sites is evidence that they are driven by a common process, daytime NO_x oxidation via NO_x and VOC-driven oxidant photochemistry (Pun, 2004). However, a later study concluded that this correspondence could also be explained by ozone transport or by daytime entrainment of nighttime nitrate formed aloft (Lurmann et. al., 2006). The Plan quoted this study's somewhat generic statement that "daytime photochemistry is VOC, sunlight, and background-ozone limited in winter", but also its conclusion that "entrainment of aerosol nitrate formed aloft at night may explain the spatial homogeneity of nitrate in the San Joaquin Valley". Lurmann, F. et. al., p.1688, cited at 2008 PM_{2.5} Plan p. 3-10; also cited on CARB VOC supplement, p.5. This study recognized the importance of the nighttime ozone pathway for nitrate formation leading to PM_{2.5}, a pathway that is not directly affected by VOC emissions reductions. The monitoring studies provide evidence that VOC-limited processes contribute to PM_{2.5} formation, but are not conclusive on the efficacy of VOC controls.

By contrast, most of the six relevant modeling studies did explicitly assess the relative effectiveness of precursor controls, though again they tended to emphasize ammonia more than VOC. One study did not directly address the issue, but stated that background ozone was the most important oxidant, implying that VOC control would have little effect (Ying et. al., 2009). The CARB VOC supplement cited this study (p.5), and CARB has stated that CARB staff involved in the CRPAQS study share this view. *See* fn 11. The other five studies explicitly evaluated precursor controls, simulating the PM_{2.5} effect of 50 percent reductions in emissions of NO_x, ammonia, and VOC. The two earliest of these studies used photochemical box models; one found VOC control to be ineffective (Stockwell, 2000), while the other found it effective (Pun and Seigneur, 2001). However, the CARB VOC supplement (p.6) noted that the Pun and Seigneur study used a doubled VOC inventory to improve model performance, so that it should not be weighted too heavily in making conclusions about the effectiveness of VOC reductions. The later three studies used more sophisticated photochemical grid models, and generally found VOC control to be effective, at least for some times and places, though generally less so than NO_x control.

One of the photochemical grid modeling studies predicted VOC control to be about 2/3 as effective as NO_x control (17.5 percent benefit from VOC vs. 25 percent from NO_x), though VOC disbenefits occurred at some smaller reductions (Kleeman, Ying, and Kaduwela, 2005). In addition, in its VOC supplement, CARB drew attention to various NO_x vs. VOC isopleth diagrams in the study, which contain curves showing the PM_{2.5} effect of various combinations of NO_x and VOC reductions. The flat or upward-tilting curves show that for the more realistic situation of NO_x and VOC reductions occurring simultaneously, VOC reductions show very little PM_{2.5} benefit, and even a disbenefit at greater NO_x reductions. CARB VOC supplement, Figs. 2 & 3, pp. 7-8, facsimiles of Figs. 3 & 5 in Kleeman, Ying, and Kaduwela, reproduced below. CARB suggests that the disbenefit may occur because in this case a VOC reduction reduces VOC-nitrate chemical reactions that form organic nitrates such as PAN; by lessening this nitrate "sink", VOC reductions leave more nitrate available to form PM_{2.5}. CARB VOC supplement, p.7

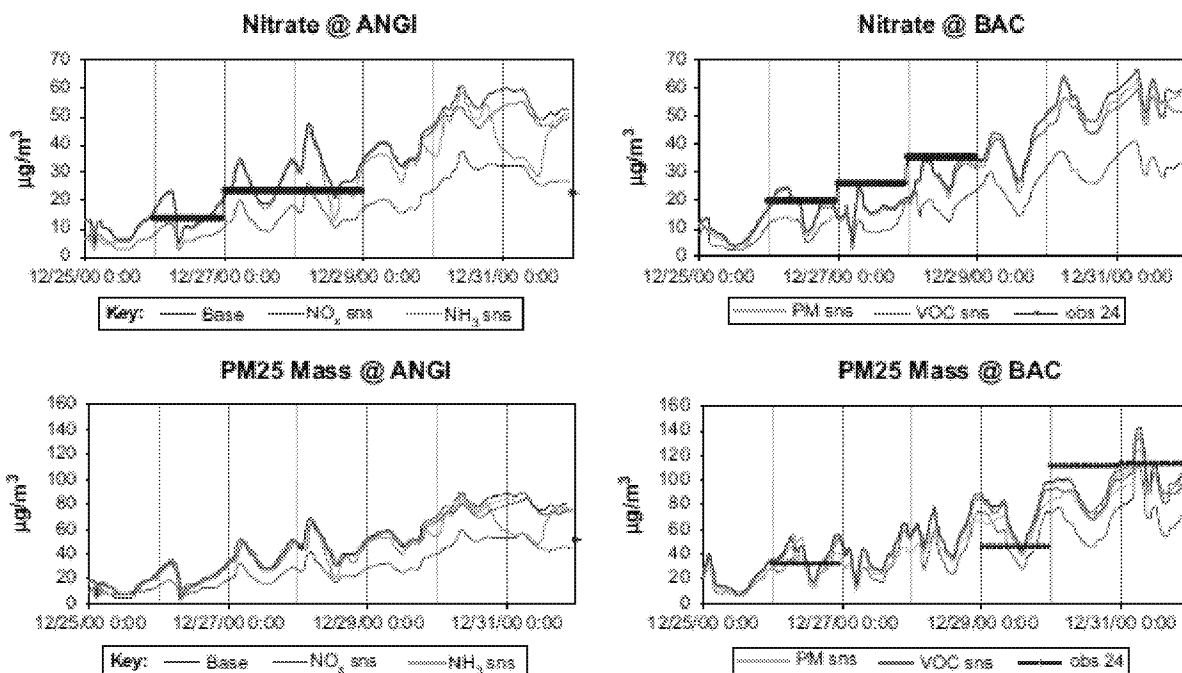
24-hour NO_x/VOC particulate isopleths, $\mu\text{g}/\text{m}^3$



Source: Kleeman, Ying, and Kaduwela, 2005, portion of Figures 3 and 5

A second study predicted VOC control to be effective, though only by a relatively small amount, at most 10 percent, or just for certain days (Pun, Balmori, and Seigneur, 2009). CARB pointed out that the days for which there is a VOC sensitivity are those with the highest PM_{2.5} levels, which occur toward the end of the modeled episode, and that this is likely due to a different chemical regime during the high PM_{2.5} days. An alternative, that the sensitivity is somehow a result of cumulative carryover of pollutants during the seven day episode, is stated to be unlikely, since 1) a large VOC photochemical contribution to nitrate formation would be expected to be accompanied by a daily rapid ozone increase that was not observed, and 2) there is little day-to-day carryover of reactive VOC or of VOC radical products such as OH and HO₂ (hydroxyl and hydroperoxyl). CARB VOC supplement, p.10. These statements are not supported by quantitative evidence, but in any case, it is apparent that there is something chemically different between the 12/25 – 12/28 period of the 2000 episode, and the 12/28 – 12/31 period; there is significant sensitivity to VOC only toward the end of the episode, when total PM_{2.5} is about 80 $\mu\text{g}/\text{m}^3$ for Angiola, and about 100 $\mu\text{g}/\text{m}^3$ for Bakersfield. CARB VOC supplement, Fig.5, p.11, reproduced below. If the daytime VOC-driven OH route for NO_x oxidation to nitrate were important, VOC sensitivity would be expected throughout the whole episode, not just the latter half with the highest PM_{2.5} concentrations.

Time series with daily observations, base case simulation results and results from four sensitivity cases of nitrate and PM_{2.5} at Angiola and Bakersfield



Source: Pun, Balmori, and Seigneur, 2009, Fig. 2.

The importance of this lack of VOC sensitivity for lower PM_{2.5} concentrations for assessment of VOC as a plan precursor is CARB's point that "nitrate was only responsive to a 50 percent reduction in VOCs at PM_{2.5} concentration levels that are no longer reached in the San Joaquin Valley... the Valley is now in a nitrate chemical formation regime that is less responsive to VOC controls." CARB VOC supplement, p. 10. This implies that the study results are of limited relevance. According to monitoring data in EPA's AQS database, there were 172 PM_{2.5} daily maximum values over 80 $\mu\text{g}/\text{m}^3$ during 1999-2002; by contrast, there were only 24 maxima over 80 $\mu\text{g}/\text{m}^3$ during 2007-2010.¹⁸ The decreased frequency of high values lends support to the CARB position, but does not imply the study results are irrelevant. It does appear, however, that there is complexity to PM_{2.5} formation in the SJV that is not fully understood, and this study did not consider the more realistic scenario of VOC and NO_x reductions occurring together.

The third grid modeling study predicted VOC control to give slightly more benefit than NO_x control (23 percent for VOC vs. 21 percent for NO_x) (Livingstone et. al., 2009). CARB pointed out that, of the various scenarios modeled in this study, the most realistic one showed a PM_{2.5} benefit of only 12 percent from a 50 percent VOC reduction, and a 38 percent benefit from a 50 percent NO_x. CARB VOC supplement, p.9.

While the models, assumptions, input data, and results differed between these studies, they provide evidence that control of VOC by itself can significantly reduce ambient PM_{2.5} concentrations in the San Joaquin Valley, at least for some times and locations. However, some

¹⁸ EPA's Air Quality System, Violation Day Count Report, May 13, 2011.

studies show little benefit, or even a disbenefit from VOC controls. The only study that thoroughly explored the effect of simultaneous VOC and NO_x reductions, a more realistic scenario given the control measures that are in place, showed a VOC disbenefit, especially for larger NO_x reductions. There is some indication that VOC sensitivity is less important for more recent episodes, with lower PM_{2.5}. Finally, there also appears to be a partial consensus in the latest work, and in the most important monitoring study, that the nighttime ozone route for nitrate formation is more important than the VOC-sensitive daytime OH route.

Altogether, the currently-available evidence does not amount to a technical demonstration that VOC should be considered a PM_{2.5} attainment plan precursor. Since there remains substantial uncertainty about the efficacy of VOC reductions, and even some danger of a disbenefit from additional VOC reductions, EPA finds that the PM_{2.5} implementation rule presumption that VOC is not an PM_{2.5} attainment plan precursor should remain in place for the time being.

It is unfortunate that the only study that explored the combined effect of NO_x and VOC reductions predated CRPAQS, the most comprehensive PM_{2.5} study for the SJV so far. It is also unfortunate that modeling tools such as process analysis were not used to investigate the change in chemical regime that appears to occur at higher PM_{2.5} concentrations, and the relative roles of the daytime and nighttime NO_x oxidation routes. It would be highly desirable for future modeling efforts, such as for the attainment demonstration needed for the new PM_{2.5} standard, to explore precursor effectiveness more definitively.

Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}	
Study and Basis	Quotes from Study
Pun and Seigneur, 1998 monitored IMS95 data	<p>p. E-3 Since only a small fraction of NO_x is converted to HNO₃... it was possible that the oxidation system was limited by the availability of oxidants. During wintertime, these oxidants may be sensitive to VOC rather than NO_x. However, these inferences need to be confirmed.</p> <p>p. E-4 However, further research is needed to understand the production of oxidants during the fall season and to assess the sensitivity of oxidants and HNO₃ to VOC and NO_x precursors.</p> <p>p. 3-14 Typical concentrations of HNO₃... and H₂O₂... suggest that the oxidant chemistry of the San Joaquin Valley may be in the VOC-sensitive regime during the winter season. This result is preliminary...</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>	
Study and Basis	Quotes from Study
<p>Stockwell <i>et al.</i>, 2000</p> <p>box model using 1997 emissions</p>	<p>p. 4715 decreases in the VOC emission rate have little effect</p>
<p>Pun and Seigneur, 2001</p> <p>box model on 3-day IMS95 episode, 4-6 January 1996</p>	<p>p. 2979 The concentration of particulate matter (PM) nitrate was found to be sensitive to reductions in VOC emissions. ... Oxidant chemistry in wintertime conditions in the San Joaquin Valley was shown to be VOC-sensitive.</p> <p>p. 2984 the production of secondary PM is greatly reduced when the VOC emissions are halved...</p> <p>A 50% reduction of VOC emissions reduces peak OH and O₃ concentrations by as much as 20%. The resulting N₂O₅ concentrations are more than proportionately reduced, and consequently, the rate of HNO₃ production by this pathway is considerably reduced.</p> <p>p. 2987 Our box model simulations point to the fact that PM formation in the SJV during winter is HNO₃-sensitive, that HNO₃ formation is oxidant-sensitive, and that oxidant formation is sensitive to reductions in VOC emissions.</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>	
Study and Basis	Quotes from Study
<p>Pun, 2004</p> <p>monitored CRPAQS data</p>	<p>p. 2</p> <p>During winter, high concentrations of PM_{2.5} and O₃ occur together in [rural] Angiola because daily peak concentrations for both species occur during the day on many days with high PM concentrations. The diurnal cycles of winter PM and O₃ at the urban sites [Fresno and Bakersfield] show a phase difference between these two pollutants.</p> <p>In Angiola, nitrate is the dominant component of winter PM_{2.5} and the daytime peaks of PM_{2.5} are caused by daytime peaks in PM_{2.5} nitrate concentrations. Since daytime conditions are comparatively less favorable for nitrate to partition into the particulate phase, peak concentrations during the 1 to 4 p.m. period are strongly indicative of a daytime chemical process occurring at this site.</p> <p>The difference in the nitrate diurnal profiles in Angiola and at the urban sites indicates that the dominant processes contributing to the observed surface nitrate concentrations may be different at urban and rural sites. Transport from aloft was assumed by Watson and Chow (2004) to account for a morning increase in nitrate concentrations at the Fresno supersite.</p> <p>p. 31</p> <p>There is some evidence that chemical production of nitrate occurs at the surface during the day. It is postulated that the daytime chemical process for the production of nitrate involves OH radicals or nitrate radicals, if it persists due to slower photolysis during the wintertime. Reliable measurements of NO₂ and HNO₃ and additional measurements of nitrate radicals may be needed to evaluate the feasibility of the nitrate reaction.</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>	
Study and Basis	Quotes from Study
<p>Kleeman, Ying, and Kaduwela, 2005</p> <p>UCD/CIT model on 3-day IMS95 episode, 4-6 January 1996</p>	<p>p. 5325 A 50% reduction in NO_x emissions applied to sources within the SJV reduced the predicted concentration of total nitrate by approximately 25% during the study episode.... A 50% reduction in VOC emissions lowered predicted concentrations of total nitrate by 17.5%, while a 50% reduction in NH₃ emissions lowered predicted concentrations of total nitrate by only 10%.</p> <p>p. 5332 at Fresno... VOC controls actually increase the amount of particulate nitrate produced by upwind sources under the conditions experienced on 6 January, 1996.</p> <p>p. 5332 at Kern Wildlife Refuge... The total concentration of nitrate increases slightly as VOC is scaled downward and then decreases with greater VOC reduction. ... A 50% reduction in VOC concentrations at Kern Wildlife Refuge leads to a predicted decrease in particulate nitrate concentrations of approximately 25–30%</p> <p>pp.5336-5338 a 50% reduction in NO_x emissions reduces maximum particulate nitrate concentrations by approximately 12 µg/m³ ...VOC and NH₃ emissions controls are not as effective as NO_x controls for particulate nitrate... a 50% reduction in VOC emissions reduces ground level particulate nitrate concentrations by only 7 µg/m³... a 50% NH₃ emissions reduction reduces ground level particulate nitrate concentrations by only 4 µg/m³</p>
<p>McCarthy, 2005</p> <p>monitored CRPAQS data</p>	<p>p. 18 Daytime HNO₃ production rates are limited by sunlight, VOCs, and background ozone</p> <p>Nighttime HNO₃ production is limited by background ozone which is abundant aloft but not at the surface</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>	
Study and Basis	Quotes from Study
Lurmann <i>et al.</i> , 2006 monitored CRPAQS data	<p>p. 1679 [“implications” sidebar] Reductions in VOC emissions will reduce secondary organic aerosol concentrations and most likely contribute to reductions in ammonium nitrate concentrations.</p> <p>p. 1688 The results indicate that ammonium nitrate formation is controlled by the formation of nitric acid and, therefore, ultimately controlled by NO_x and VOC emission rates and background O₃ concentrations that control the rate of NO_x oxidation. This analysis is not able to assess the relative benefits of controlling NO_x or VOC emissions for reducing nitric acid levels.</p> <p>p. 1689 The average diurnal pattern of nitrate at Sierra Nevada Foothills is one that could be expected from photochemical activity, yet the afternoon nitrate peak at this site is more likely because of transport of pollution from the SJV than photochemistry. The average diurnal pattern for the three core sites in the SJV (Fresno, Bakersfield, and Angiola) suggests that the daytime nitric acid production is relatively slow.</p> <p>p. 1690 Valley-wide nighttime production of ammonium nitrate aloft followed by daytime entrainment into the surface layer could explain the spatial homogeneity of wintertime ammonium nitrate levels in the SJV</p> <p>p. 1690 Continuous aerosol nitrate data, in conjunction with NO and O₃ data, suggest that both daytime and nighttime nitric acid formation pathways are active in the SJV.</p> <p>pp. 1690-1691 The CRPAQS data examined here tend to support the valley-wide nighttime production aloft hypothesis.</p> <p>p. 1692 Estimated secondary organic aerosol concentrations are small compared with concentrations of likely VOC precursors; however, the estimated secondary portion of PM_{2.5} OC and PM_{2.5} mass is significant in several locations.</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>	
Study and Basis	Quotes from Study
<p>Pun, Balmori, and Seigneur, 2009</p> <p>CMAQ-MADRID model on 1-week CRPAQS episode, 25-31 December 2000</p>	<p>p. 402</p> <p>Nitrate was only weakly sensitive to reductions in anthropogenic VOC emissions.</p>
	<p>p. 402</p> <p>A control strategy that focuses on NO_x and PM emissions would be effective on average, but reductions in VOC and NH₃ emissions would also be beneficial for certain times and locations.</p>
	<p>p.405</p> <p>Reductions in anthropogenic VOC led to decreased O₃ concentrations at both urban and rural sites. However, there was virtually no effect on OM</p>
	<p>p. 408</p> <p>The reduction in NO_x emissions by 50% induced a strong response in nitrate concentrations. At the rural site, nitrate reductions approached 50% on average, and the time series in Fig. 2 shows a consistent decrease throughout the episode. At Bakersfield, reductions were of the order of 30–45% and were less than linear.</p>
	<p>p. 408</p> <p>As discussed previously, the reduction of anthropogenic VOC emissions reduced O₃ concentrations in both urban and rural locations. However, nitrate concentrations were less sensitive to anthropogenic VOC emissions than to NO_x emissions on average. Reductions in anthropogenic VOC emissions consistently caused small reductions in nitrate in the urban areas, even when nitrate increases resulted from reductions in NO_x emissions. Rural nitrate concentrations were quite insensitive to anthropogenic VOC emissions on some days. [Fig. 2 shows at most 10% reduction in PM_{2.5} peaks at Angiola and Bakersfield.]</p>
	<p>p. 408</p> <p>an effective control strategy for PM_{2.5} in the SJV that is comprehensive in time and location may require controls of multiple precursors rather than a single key precursor.</p>

<p>Table C-1 San Joaquin Valley Modeling and Monitoring Study Findings on VOC as a Precursor for PM_{2.5}</p>									
Study and Basis	Quotes from Study								
<p>Ying, Lu, and Kleeman, 2009</p> <p>UCD/CIT model on 3-week CRPAQS episode, 15 December 2000 to 7 January 2001</p>	<p>p. 424</p> <p>The NO_x is not immediately transformed into nitric acid/NH₃ nitrate due to slow photochemical reactions in the winter. Background ozone is the most important oxidant for reactive nitrogen with gradual conversion of NO_x to particulate nitrate over several days.</p>								
<p>Livingstone <i>et. al.</i>, 2009</p> <p>CMAQ model on 3-week CRPAQS episode, 17 December 2000 to 7 January 2001</p>	<p>p. 5971</p> <p>We found that emission reductions of NO_x and AVOC [anthropogenic VOC] showed similar effects on percentage basis in different areas, and both are more effective than reducing NH₃ for abating elevated concentrations of accumulation mode PM in California Central Valley during the winter episode.</p> <p>p. 5971</p> <p>[excerpt from] Table 1. Model results for ammonium nitrate at a Bakersfield station. Sensitivity of two-week average (ammonium + nitrate) to precursor reductions</p> <table> <tr> <td>[precursor]</td><td>[response]</td></tr> <tr> <td>-50% NO_x</td><td>-21% PM_{2.5}</td></tr> <tr> <td>-50% AVOC</td><td>-23% PM_{2.5}</td></tr> <tr> <td>-50% NH₃</td><td>-8.8% PM_{2.5}</td></tr> </table> <p>p. 5976</p> <p>The fine aerosol concentration was more sensitive to AVOC than NO_x in small areas around a Bakersfield station with high concentrations of accumulation mode PM</p>	[precursor]	[response]	-50% NO _x	-21% PM _{2.5}	-50% AVOC	-23% PM _{2.5}	-50% NH ₃	-8.8% PM _{2.5}
[precursor]	[response]								
-50% NO _x	-21% PM _{2.5}								
-50% AVOC	-23% PM _{2.5}								
-50% NH ₃	-8.8% PM _{2.5}								

Notes: CRPAQS and IMS95 are described on the Central California Air Quality Studies web site, <http://www.arb.ca.gov/airways/crpaqs/publications.htm>

CPAQs is the California Regional Particulate Air Quality Study, a field study conducted from December 1999 through February 2001.

IMS95 is the 1995 Integrated Monitoring Study, a field study that included a four week winter sampling program in December 1995 and early January 1996.

Central California Air Quality Studies web site, CRPAQS Documents and Publications page: <http://www.arb.ca.gov/airways/crpaqs/publications.htm>

Studies cited in table are:

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Lurmann, F.W., Brown, S.G., McCarthy, M.C., and Roberts P.T., 2006, "Processes Influencing Secondary Aerosol Formation in the San Joaquin Valley During Winter", *Journal of the Air & Waste Management Association*, 56: 1679-1693.

McCarthy, M., 2005, "The Role of Nighttime Chemistry in Winter Ammonium Nitrate Formation in the San Joaquin Valley", presented at the American Association for Aerosol Research (AAAR), Supersites Conference, February 2005, Atlanta, GA. Available on CRPAQS web page listed above; direct link: http://www.arb.ca.gov/airways/Documents/AAAR/2005/mccarthy_nitrate_present.pdf

Pun, B.K. and Seigneur, C., 1998, "Conceptual Model of Particulate Matter Pollution in the California San Joaquin Valley", prepared by Atmospheric and Environmental Research for Pacific Gas & Electric, Document Number CP045-1-98, 8 September 1998. Available on CRPAQS web page listed above; direct link: <http://www.arb.ca.gov/airways/Documents/reports/sjvpmmc~1.pdf>

Pun, B.K. and Seigneur, C., 2001, "Sensitivity of Particulate Matter Nitrate Formation to Precursor Emissions in the California San Joaquin Valley", *Environmental Science and Technology*, 35: 2979-2987. doi: 10.1021/es0018973

Pun, B., 2004, "CRPAQS Task 2.7 When and Where Does High O₃ Correspond to High PM_{2.5}? How Much PM_{2.5} Corresponds to Photochemical End Products?", prepared by Atmospheric and Environmental Research, Inc. for the San Joaquin Valleywide Air Pollution Study Agency. Available on CRPAQS web page listed above; direct link: <http://www.arb.ca.gov/airways/crpaqs/workshop/AER2.pdf>

Pun, B.K., Balmori R.T.F, and Seigneur, C., 2009, "Modeling Wintertime Particulate Matter Formation in Central California", *Atmospheric Environment*, 43: 402-409. doi: doi:10.1016/j.atmosenv.2008.08.040

Stockwell, W.R., Watson, J.G., Robinson, N.F., Steiner, W., and Sylte, W.W., 2000, "The Ammonium Nitrate Particle Equivalent of NO_x Emissions for Continental Wintertime Conditions", *Atmospheric Environment*, 34: 4711-4717. doi:10.1016/S1352-2310(00)00148-5

Ying, Q., Lu, J., and Kleeman, M., 2009, "Modeling air quality during the California Regional PM₁₀/PM_{2.5} Air Quality Study (CPRAQS) using the UCD/CIT source-oriented air quality model - Part III. Regional source apportionment of secondary and total airborne particulate matter", *Atmospheric Environment*, 43: 419-430, January 2009. doi:10.1016/j.atmosenv.2008.08.033.

3. Conclusions

EPA concurs with the evaluation in the 2008 PM_{2.5} Plan that, at this time, ammonia does not need to be considered an attainment plan precursor for purposes of attaining the 1997 PM_{2.5} NAAQS.

The information submitted by CARB raises legitimate questions about the extent to which VOC emissions contribute to ambient PM_{2.5} concentrations in SJV, and other existing information on the contribution of VOC emissions to ambient PM_{2.5} levels in the SJV, do not provide a basis for reversing the presumption that VOC is not an attainment plan precursor. Accordingly, EPA maintains the presumption that VOC is not an attainment plan precursor in the SJV for the 1997 PM_{2.5} standards, in the absence of a clear technical demonstration that the presumption is incorrect.¹⁹ We note that because the SJV is designated as nonattainment for the

¹⁹ In its approval of the SJV 2003 PM₁₀ plan, EPA determined that for the purposes of section 189(b)(1)(B) and (e) and in the absence of final data from CRPAQS, VOC does not contribute significantly to PM₁₀ levels which exceed the standards in the SJV. *See* 69 FR 30006, 30011 (May 26, 2004). In that determination, EPA relied on the criteria that VOC control was not shown to be absolutely necessary for PM₁₀ attainment and that it had a lower effectiveness than NO_x control in reducing PM₁₀. In addition, EPA noted in its 2004 final rule the District's intention to re-examine the VOC issue when CRPAQS results were available. 69 FR 30006, 30010.

8-hour ozone standard, this area is already required to adopt VOC control measures for ozone purposes, which may provide a co-benefit for PM_{2.5} concentrations. *See* 72 FR 20586, 20593.

We received a number of public comments disagreeing with our finding that there is no clear technical documentation that supports reversing the presumption that VOC is not a attainment plan precursor for the 1997 PM_{2.5} standards in the SJV. These comments did not provide any substantive new information or interpretation of the existing data that would lead us to a different conclusion. We summarize these comments and provide full responses in section III.D. of this TSD.

It should be noted that EPA's concurrence on excluding ammonia and VOC as attainment plan precursors is limited to the attainment of the 1997 PM_{2.5} NAAQS. EPA revised the 24-hour PM_{2.5} standard in 2006 to lower it to 35 µg/m³ and is currently reviewing both the annual and 24-hour standards to determine if they should be further lowered to protect public health. *See* EPA, Policy Assessment for the Review of the Particulate Matter NAAQS, Second External Review Draft, June 2010. Evaluation of ammonia and VOC controls for the attainment of the 2006 standard and any future lower standards may show that such controls would significantly contribute to lower PM_{2.5} levels in the Valley.

Since its 2004 finding, EPA promulgated the PM_{2.5} implementation rule, which has an explicit criterion for determining which PM_{2.5} precursors must be evaluated for controls, namely, that a significant change in emissions of the precursor would be projected to provide a significant change in PM_{2.5} concentrations in the nonattainment area. *See* 72 FR 20586, 20590 and 40 CFR § 51.1000. This is a different criterion than the one relied on in the 2004 determination. Data and analyses from CRPAQS have also become available.

D. Reasonably Available Control Measures/Reasonably Available Control Technology

1. Requirements for RACM/RACT

CAA section 172(c)(1) requires that each attainment plan “provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology [RACT]), and shall provide for attainment of the national primary ambient air quality standards.”

We interpret reasonably available control measures (RACM) in CAA section 172(c)(1) as referring to measures of any type that may be applicable to a wide range of sources, whereas the parenthetical reference to reasonably available control technology (RACT) refers to measures applicable to stationary sources. Thus, RACT is a type of RACM specifically designed for stationary sources. 72 FR 20586, 20610.

EPA defines RACM as any potential control measure for application to point, area, on-road and non-road emission source categories that meets the following criteria: the control measure is (1) technologically feasible, (2) economically feasible, (3) does not cause “substantial widespread and long-term adverse impacts,” (4) is not “absurd, unenforceable, or impracticable,” and (5) collectively can advance the attainment date by at least one year. 72 FR 20586, 20610. We define RACT as the lowest emission limitation that a particular stationary source is capable of meeting by the application of technology (i.e., devices, systems, process modifications, or other apparatus or techniques that reduce air pollution) that is reasonably available considering technological and economic feasibility. 72 FR 20586, 20610.

For PM_{2.5} attainment plans, EPA is requiring a combined approach to RACM and RACT under subpart 1 of Part D of the CAA. Under this approach, RACM/RACT are measures that a state finds are both reasonably available and contribute to attainment as expeditiously as practicable in its nonattainment area. Thus, what constitutes RACM/RACT in a PM_{2.5} attainment plan is closely tied to that plan’s expeditious attainment demonstration. 40 CFR § 51.1010; 72 FR 20586, 20612. By definition, measures that are neither necessary for meeting the RFP requirement nor helping an area attain the NAAQS as expeditiously as practicable are not required RACM/RACT. A state’s attainment plan must include a list of measures considered and information sufficient to show that a state has met all requirements for determination of RACM/RACT. 72 FR 20586, 20612. A state must evaluate RACM/RACT for each identified PM_{2.5} attainment plan precursor.

Under this combined approach, EPA considers RACT be part of an area’s overall RACM obligation. Subpart 1, unlike subparts 2 and 4 of title 1, Part D of the CAA, does not identify specific source categories for which EPA must issue control technology documents or guidelines for what constitutes RACT or identify specific source categories for state evaluation during attainment plan development. 72 FR 20586, 20610. Because of the variable nature of the PM_{2.5} problem between nonattainment areas, which may require states to develop attainment plans that address widely disparate circumstances, EPA determined that a state should have flexibility with respect to RACT and RACM controls but also that in areas needing significant emissions

reductions to attain the standards, RACT/RACM controls on smaller sources may be necessary to reach attainment as expeditiously as practicable. 72 FR 20586, 20612 and 20615.

The determination of RACM/RACT is a three-step process: (1) identifying technologically and economically feasible measures and associated emissions reductions, (2) conducting air-quality modeling and related analyses, and (3) selecting RACM/RACT. 72 FR 20586, 20613. Any measures that are necessary to meet these requirements which are not already either federally promulgated, part of the state's SIP, or otherwise creditable in SIPs must be submitted in enforceable form as part of a state's attainment plan for the area. 72 FR 20586, 20614.

The first step, identification of potential measures, should be based on an inventory of emissions of direct PM_{2.5} and PM_{2.5} attainment plan precursors from the range of relevant sources and source categories. 72 FR 20586, 20613. A state is required to evaluate RACM/RACT for direct PM_{2.5} and SO₂. A state is also required to evaluate RACM/RACT for NO_x sources unless it finds that such sources do not significantly contribute to the PM_{2.5} levels in its area. 72 FR 20586, 20613. Significantly contribute in this context means that a significant change in emissions of the precursor from sources in the area would be projected to provide a significant change in PM_{2.5} concentrations in the area. 72 FR 20586, 20590.

In the preamble to the PM_{2.5} implementation rule, EPA provided a recommended list of the types of source categories and control measures that may be appropriate for evaluation given the local source mix and attainment needs of a specific area. 72 FR 20586, 20621.

Technological feasibility refers to whether there are available measures capable of reducing emissions of PM_{2.5} or PM_{2.5} precursors or both. A number of factors are considered in this analysis, such as process and operating conditions, raw materials, physical plant layout, non-air quality and energy impacts, and the time needed to install and operate controls. 72 FR 20586, 20618.

Economic feasibility refers to whether the cost of a measure is reasonable for the source or source category. A number of factors are considered in this analysis, such as cost per ton of pollution reduced, capital costs and annualized cost. 72 FR 20586, 20619.

2. RACM/RACT Analysis in the SJV PM_{2.5} SIP

The 2008 PM_{2.5} Plan and the 2007 State Strategy are the latest in a series of air quality plans that the District and CARB have developed to provide for attainment of the federal air quality standards in the SJV.²⁰ These planning efforts have resulted in a comprehensive set of rules and programs that address the vast majority of emissions sources in the Valley. Many of these District and State rules are among the most stringent in the nation.

For the 2008 PM_{2.5} Plan and the 2007 State Strategy, the District, CARB, and the local agencies (through the SJV's eight metropolitan planning organizations (MPO)) each undertook a process to identify and evaluate potential reasonably available control measures that could

²⁰ These plans include the 2003 PM₁₀ Plan (approved, 69 FR 30005 (May 26, 2004)), the 2004 Extreme Ozone Attainment Plan (approved 75 FR 10420 (March 8, 2010)), and the 2007 Ozone Plan (submitted November 16, 2007).

contribute to expeditious attainment of the PM_{2.5} standards in the SJV. We describe each agency's efforts below.

a. District RACM/RACT Analysis

The District's RACM/RACT analysis and its results are described in Chapter 6 and Appendix I of the 2008 PM_{2.5} Plan. The analysis focused on controls for the categories of stationary and area sources under the District's direct jurisdiction.

To identify potential RACM/RACT, the District reviewed potential measures from a number of sources including but not limited to:

- EPA's list of potential PM_{2.5} control measures (in the PM_{2.5} implementation rule preamble);
- control strategies and measures from other districts and agencies, including the South Coast AQMD, Sacramento Metropolitan AQMD, Bay Area AQMD, and Ventura County APCD;
- further study measures in the SJV 2007 Ozone Plan;
- measures suggested by the public including those recommended by the International Sustainable Systems Research Center (ISSRC) in its draft document "Clearing the Air: A Path to Clean Air by 2017," dated August 2007;
- recommendations from CARB's 2003 audit of the District; and
- recommendations from the 2007 CARB staff report, "Accelerating Attainment in the San Joaquin Valley" November 6, 2007.

2008 PM_{2.5} Plan, pp. 6-6 to 6-8.

The identified potential measures, as well as existing District measures, are described by emissions inventory category in Appendix I. These measures address emissions of direct PM_{2.5}, NO_x and SO_x. *See* 2008 PM_{2.5} Plan, p. 6-8 and Appendix I. Potential RACM/RACT controls for VOC or ammonia were not specifically identified or evaluated. From this set of potential controls, the District developed a Stationary Source Regulatory Implementation Schedule (2008 PM_{2.5} Plan, Table 6-2) which gives the schedule for regulatory adoption and implementation of the selected RACM/RACT measures. *See also* Table F-1 of this TSD. The schedule was developed based on a variety of factors, including:

- technological feasibility and practicality of emission controls;
- magnitude of emissions from the source category and likely emissions reductions (where possible to determine);
- cost, financial impacts, and potential for socioeconomic impacts (e.g., employment, profitability);
- District authority and enforceability of emissions reductions;
- rate and timing of emissions reductions;
- public acceptability, including interests and concerns of community members;
- pollutants reduced – NO_x, PM_{2.5}, VOC, SO_x, or multiple pollutants;
- any potential adverse environmental impacts; and
- potential for disparate environmental impacts (environmental justice).

2008 PM_{2.5} Plan, p. 6-7.

The District also identified a number of source categories for which feasibility studies to refine the inventory and evaluate potential controls would be done. These categories and the schedule for studying them are given in Table 6-4 of the 2008 PM_{2.5} Plan and Table F-6 of this TSD.

The Plan also includes descriptions of the District's incentive programs (which target on- and off-road engine replacement with an emphasis on diesel engines), its innovative strategies program including its Fast Track emissions reductions measures, and public education efforts. *See* 2008 PM_{2.5} Plan, pp. 6-13 to 6-23. *See also*, SJV PM_{2.5} Progress Report, sections 2.3 and 2.4.

Since submittal of the 2008 PM_{2.5} plan, the District has adopted a number of measures intended to meet its commitments and provide for the implementation of RACM/RACT.

b. Local Jurisdictions' RACM Analysis

The local jurisdictions' RACM/RACT analysis was conducted by the SJV's eight MPOs.²¹ This analysis, which focused on potential NO_x emissions reductions from transportation control measures (TCM) and builds on the work done for the SJV 2007 Ozone Plan. TCMs are generally measures designed to reduce emissions from on-road motor vehicles through reductions in vehicle miles traveled or traffic congestion. The results of the MPOs' analysis are described in Chapter 7 of the 2008 PM_{2.5} Plan.

For the SJV 2007 Ozone Plan, the SJV MPOs developed a local RACM strategy which consisted of two parts: (1) evaluation of potential RACM for advancing the 8-hour ozone standard attainment date and (2) the adoption of a Congestion Mitigation and Air Quality (CMAQ) policy to fund cost-effective emissions reductions projects.

For the 2008 PM_{2.5} Plan, the MPOs reviewed and updated the evaluation of potential RACM from the 2007 Ozone Plan following EPA's guidance in the PM_{2.5} implementation rule preamble. The evaluation is documented in the 2008 PM_{2.5} Plan on pp. 7-8 to 7-11 and included the following steps:

Step 1: Identification of potential new measures: The MPOs reviewed the measures in the 2007 Ozone Plan, EPA's draft list of PM_{2.5} measures (*see* 72 FR 20586, 20621), and other SIPs including the South Coast 2007 AQMP and the New Jersey 2007 SIP. No new measures were identified that had not already been considered in the 2007 Ozone Plan.

Step 2: Calculation of the possible emissions reductions from potential TCM: Given the nature of the PM_{2.5} problem in the SJV, the analysis focused on NO_x to assess whether the reductions from these TCM could advance attainment. It did not look at potential emissions reductions of direct PM_{2.5}, SO_x, VOC, or ammonia.

In the 2007 Ozone Plan, emissions reductions estimates were calculated for the list of possible local TCM. The maximum feasible emissions reductions for NO_x estimated from implementing all of these TCMs are approximately 7 tons per day (tpd) in 2020 and 5 tpd in 2023. 2008 PM_{2.5} Plan, p. 7-10. These estimates are based on the maximum travel reductions that

²¹ These eight MPOs represent the eight counties in the San Joaquin Valley air basin: the San Joaquin Council of Governments, the Stanislaus Council of Governments, the Merced County Association of Governments, the Madera County Transportation Commission, the Council of Fresno County Governments, Kings County Association of Governments, the Tulare County Association of Governments and the Kern Council of Governments.

could be expected from the applicable measures and the average gram/mile emission rate of light-duty vehicles (i.e., passenger cars and light-duty trucks) operated during the summer.

These summer time estimates for NO_x reductions for 2020 and 2023 needed to be adjusted to reflect 2013/2014. Due to the benefits of fleet turnover and increasingly stringent motor vehicle emission standards, the fleet average emission rates in 2020 and 2023 are projected to be lower than those in 2013/2014. This means the NO_x reductions estimated in 2020 and 2023 underestimate the reductions that could be produced in earlier years. Using a ratio of fleet average NO_x emission rates for light-duty vehicles in 2013 to 2020 (2.07), maximum reductions are estimated to produce a reduction of roughly 14 tpd in 2013 (assuming the same level of travel reductions apply in 2013 as did in 2020 and 2023).²² Unlike ozone levels which are higher in the summer time, PM_{2.5} levels in the SJV are higher in the winter time. Because mobile source NO_x emissions are higher in the summer than winter, NO_x reductions for summer will be higher than for the winter. Thus, applying the reductions estimated for the summertime to the wintertime to evaluate whether the implementation of TCM would advance attainment in the SJV is conservative (i.e., over estimate the potential emissions reductions). 2008 PM_{2.5} Plan, p. 7-10.

Step 3: The emissions reductions estimates were compared against the attainment demonstration to determine if they collectively advance attainment by a full year. Using Table 9-1 from the draft PM_{2.5} plan, it was estimated that an additional 93.1²³ tons per average annual day of NO_x emissions reductions would be necessary in 2013 to advance attainment of the PM_{2.5} standard by one year which is considerable more than the estimated 14 tpd of potential NO_x reductions from TCM. 2008 PM_{2.5} Plan, p. 7-11.

Based on the above analysis, the MPOs determined that there were no additional local RACM, beyond those measures already adopted, that would advance attainment of the PM_{2.5} NAAQS in the SJV and thus no additional adoption of measures was necessary. 2008 PM_{2.5} Plan, p. 7-11.

The eight MPOs did adopt a CMAQ policy that includes developing a standardized process across the Valley for distributing, beginning in FY2011, 20 percent of the CMAQ funds to projects that meet a minimum cost-effectiveness. This policy focuses on achieving the most cost-effective emissions reductions, while maintaining flexibility to meet local needs. 2008 PM_{2.5} Plan, p. 7-8.

²² The methodologies and assumptions used to derive this number overstate the true potential reductions from reasonable TCMs in the SJV. For example, one assumption used is that the effectiveness of measures (e.g., transit improvements) will be the same in rural areas as they are in urban areas, even though TCMs are generally much less effective in rural areas. See Sierra Research, *Reasonable Available Control Measure (RACM) Analysis*, March 5, 2007, pp. 2-3 (which may be found in Appendix C of the SJV 2007 Ozone Plan).

²³ Calculated as the 2013 controlled level of emissions (394.3 tpd) minus the attainment level (291.2 tpd). Values from 2008 PM_{2.5} Plan, Table 9-1. Based on the information in the 2011 Progress Report, this value would be 15.6 tpd after adjustments due to the recession and updated estimates of reductions from District's adopted controls. See Table E-2 of this TSD.

c. State's RACM Analysis

CARB describes its proposed strategy to reduce emissions from sources within its jurisdiction – on- and off-road engines and vehicles, fuels, and consumer products – in Chapter 3 of the 2007 State Strategy. California has unique authority under the CAA to adopt standards for most categories of on- and off-road engines and vehicles, subject in most instances only to a waiver by EPA under CAA section 209.

CARB developed its proposed statewide strategy after an extensive public consultation process to identify potential SIP measures. This process is described in the 2008 PM_{2.5} Plan, p. 7-11. It included a SIP Symposium in October 2006 and a workshop in November 2006 to discuss development of potential control concepts for meeting the federal 8-hour ozone and PM_{2.5} standards.²⁴ CARB made available a draft of the 2007 State Strategy for public review in April 2007 and then conducted a series of public workshops on the draft. On April 26, 2007, CARB staff released a revised draft of the Proposed State Strategy that incorporated changes based on further staff analysis and public comments. CARB Resolution 07-28, p. 3.

From this process, CARB identified and committed to propose 15 new defined measures to address California's ozone and PM_{2.5} nonattainment problem. 2007 State Strategy, p. 65 and CARB Resolution 7-28, Attachment B, p. 8. These measures focused on cleaning up the in-use ("legacy") fleet as well as increasing the stringency of emissions standards for a number of engine categories and further reductions from motor vehicle fuels and consumer products. Many, if not most of these measures, were being proposed and adopted for the first time anywhere in the nation. They built on CARB's already comprehensive program to address emissions of direct PM_{2.5}, NO_x, VOC, and SO_x from all types of mobile sources, through both regulations and incentive programs, as well as from fuels and consumer products. *See* 2007 State Strategy, p. 38. Table D-1 lists these measures and includes one additional measure each from the California Bureau of Automotive Repair and the California Department of Pesticide Regulation. Table D-2 provides the list of these measures as updated in the 2011 Progress Report.

²⁴ More information on this public process including presentations from the workshops and symposium that preceded adoption of the 2007 State Strategy can be found at www.arb.ca.gov/planning/sip/2007sip/.

Table D-1 2007 State Strategy Defined Measures Schedule for Consideration Ozone and PM_{2.5} Measures		
Defined State Measure	Expected Adoption	Expected Implementation
Smog Check Improvements	2007-2008	By 2010
Expanded Vehicle Retirement	2008-2014	2008-2014
Modification to Reformulated Gasoline Program	2007	Phase-in starting 2010
Cleaner In-Use Heavy Duty Trucks	2008	2010-2015
Auxiliary Ship Cold Ironing and Clean Technologies	2007-2008	Phase-in starting 2010
Cleaner Main Ship Engines and Fuels	Fuel: 2007 Engines: 2009	Fuel: 2007-2010 Engines: Phase-in starting 2010
Port Truck Modernization	2007-2008	2008-2020
Accelerated Introduction of Cleaner Line-Haul Locomotives (enforceable agreement)	2007-2008	Starting in 2012
Clean Up Existing Harbor Crafts	2007	2009-2018
Cleaner In-Use Off-Road Equipment	2007	Phase-in starting 2008
Cleaner In-Use Agricultural Equipment	2009	Phase-in starting 2014
New Emissions Standards for Recreational Boats	2009-2010	2012-2013
Expanded Off-Road Recreational Vehicle Emissions Standards	By 2010	2012-2015
Enhanced Vapor Recovery for Above Ground Storage Tanks	2007	Phase-in starting 2008
Additional Evaporative Emissions Standards	By 2010	2010-2012
Consumer Products Program (I & II)	2007-2008 2010-2012	By 2010 By 2012-2014
Department of Pesticides Pesticide Regulation	2008	2008

Source: CARB Resolution 07-28, Attachment B, p. 8.

Table D-2 Updated 2007 State Strategy: PM_{2.5} SIP Measures South Coast and San Joaquin Valley	
Defined State Measure	Action
Smog Check Improvements	2007-2009
Expanded Vehicle Retirement	2007
Modification to Reformulated Gasoline Program	2007
Cleaner In-Use Heavy Duty Trucks	2007, 2008, 2010
Auxiliary Ship Cold Ironing and Clean Technologies	2007-2008
Cleaner Main Ship Engines and Fuels	Fuel: 2008-2011 Engines: 2008
Port Truck Modernization	2007, 2008, 2010
Accelerated Introduction of Cleaner Line-Haul Locomotives (enforceable agreement)	2008
Clean Up Existing Harbor Crafts	2007, 2010
Cleaner In-Use Off-Road Equipment	2007, 2010
New Emissions Standards for Recreational Boats	Expected 2013
Expanded Off-Road Recreational Vehicle Emissions Standards	Expected 2013
Enhanced Vapor Recovery for Above Ground Storage Tanks	2008
Additional Evaporative Emissions Standards	2009 Expected 2013
Consumer Products Program (I & II)	2008, 2008, 2011
Department of Pesticides Pesticide Regulation	2008, 2009

Source: 2011 Progress Report, Table 1

3. Proposed Actions on the RACM/RAC T Demonstration

In November 2010, EPA proposed to disapprove the RACM/RAC T demonstration in the SJV 2008 PM_{2.5} SIP based on our proposed disapproval of the attainment demonstration and proposed denial of California's attainment date extension request. We also proposed to disapprove the RACM/RAC T demonstration because it did not evaluate potential controls on VOC. *See* 2010 Proposal TSD, section II.D. and 75 FR 74518, 74528.

In our July 2011 proposed actions on the SJV 2008 PM_{2.5} SIP, we proposed to approve RACM/RAC T demonstration based on our proposal to grant California's request to extent the attainment date for the SJV until April 5, 2014 and to approve the attainment demonstration in the 2008 PM_{2.5} plan as providing for expeditious attainment of the 1997 PM_{2.5} standards in the San Joaquin Valley by that date. The proposal to approve the RACM/RAC T demonstration was also based on our proposed concurrence that VOC should be considered a PM_{2.5} attainment plan precursor for the 1997 PM_{2.5} NAAQS in the SJV. *See* 2011 Proposal TSD, section II.D. and 76 FR 41338, 41347.

4. Evaluation and Conclusions

Under the PM_{2.5} implementation rule, RACM/RAC T are the set of measures necessary for expeditious attainment. The measures must address emissions of direct PM_{2.5}²⁵ and all PM_{2.5} attainment plan precursors that are necessary for expeditious attainment. Thus, in order for a PM_{2.5} plan to demonstrate that it provides for RACM/RAC T, it must also demonstrate that it provides for expeditious attainment. 72 FR 20586, 20612-20623.

As discussed in Sections II.E and G. of this TSD, we are granting California's request to extent the attainment date for the SJV until April 5, 2014 and approving the attainment demonstration in the 2008 PM_{2.5} plan as providing for expeditious attainment of the 1997 PM_{2.5} standards in the San Joaquin Valley by that date.

As discussed in Section II.C. of this TSD, EPA is concurring with the evaluations in the 2008 PM_{2.5} Plan and supplemental information provided by CARB, at this time, ammonia and VOC do not need to be considered attainment plan precursors for purposes of attaining the 1997 PM_{2.5} NAAQS in the SJV.

Therefore, EPA finds that the 2008 PM_{2.5} Plan, together with the 2007 State Strategy, provides for the implementation of all RACM/RAC T necessary for expeditious attainment of the 1997 PM_{2.5} standards in the San Joaquin Valley as required by CAA section 172(c)(1) and 40 CFR § 51.1010 and approves the SJV PM_{2.5} SIP's RACM/RAC T demonstration pursuant to these sections.

We received a number of public comments disagreeing with our finding that the SJV 2008 PM_{2.5} SIP provided for the implementation of RACM/RAC T and suggesting a number of additional measures that should be considered RACM/RAC T. We have considered these comments and measures and determined that none adversely affect our finding that the SIP

²⁵ Condensable PM_{2.5}, which is considered direct PM_{2.5}, did not need to be addressed in rules prior to January 1, 2011. 40 CFR § 51.1002(c).

provides for RACM/RACT. We summarize these comments and provide full responses to them in section III.E. of this TSD.

Petitions for consideration on provisions of the PM_{2.5} Implementation Rule related to RACT:

As discussed in section I.A.2.b., EPA received a petition for reconsideration of several provisions in the PM_{2.5} implementation rule including three provisions related to RACT. We describe each below and whether the provisions affect our action on the RACM/RACT demonstration in the SJV 2008 PM_{2.5} SIP:

1. The presumption that compliance with the Clean Air Interstate Rule (CAIR) satisfies the NO_x and SO₂ RACT requirements for electric generating units. 72 FR 20586, 20623-28.

The SJV nonattainment area was not subject to the CAIR which was intended to control the interstate transport of pollutants in the eastern United States. *See* 70 FR 25162 (May 12, 2005).
2. The allowance for states to defer establishing emission limits for condensable PM (CPM) until January 1, 2011. 72 FR 2058, 20652 (codified at 40 CFR § 51.1002(c)).

EPA will evaluate any rule adopted or revised after January 1, 2011 to assure that it appropriately addresses CPM.
3. The revisions to the criteria for analyzing the economic feasibility of RACT from a presumption that a given source must bear a cost similar to other sources to a consideration of whether the cost of a measure is reasonable for the regulated entity to bear, in light of benefits. 72 FR 20586, 20619-20620.

While the 2008 PM_{2.5} Plan includes some discussion of criteria for economic feasibility that seem to reflect the revised criteria in the PM_{2.5} implementation rule (*see* pp. 6-2 and 6-7), we can find no example of where those criteria actually resulted in the rejection of a potential RACT measure.

E. Attainment Date Extension

1. Requirements for Attainment Date Extensions

CAA section 172(a)(2)(A) states that an area's attainment date "shall be the date by which attainment can be achieved as expeditiously as practicable, but no later than 5 years from the date such area was designated nonattainment..., except that the Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period no greater than 10 years from the date of designation as nonattainment considering the severity of nonattainment and the availability and feasibility of pollution control measures." Because the initial PM_{2.5} designations, including that for the SJV nonattainment area, have an effective date of April 5, 2005, the initial attainment date for PM_{2.5} areas is no later than April 5, 2010. For any areas that EPA grants the full 5-year attainment date extension under section 172(a), the attainment date is no later than April 5, 2015.

Section 51.1004 of the PM_{2.5} implementation rule addresses the attainment date requirement. Section 51.1004(b) requires a state to submit an attainment demonstration justifying its proposed attainment date and indicates that EPA will approve an attainment date at the same we approve the attainment demonstration. Thus, our approval of an extended attainment date is dependent upon a demonstration showing expeditious attainment.

A state that requests an extension of the attainment date under CAA section 172(a)(2)(A) must provide sufficient information to show that attainment by the initial attainment date of April 5, 2010 is impracticable due the severity of the nonattainment problem in the area and the lack of available control measures. It must also demonstrate that all local control measures that are reasonably available and technologically feasible for the area are being implemented to bring about expeditious attainment of the standard by the alternative attainment date for the area. The state's plan will need to project the emissions reductions expected due to federal and state regulations and local measures such as RACT and RACM, and then conduct modeling to project the level of air quality improvement in accordance with EPA's modeling guidance. EPA will not grant an extension of the attainment date for an area beyond the initial 5 years allowed by section 172(a)(2)(A) if the state has not considered the implementation of all RACM and RACT local control measures for the area. 72 FR 20586, 20601.

2. Proposed Attainment Date in the SJV 2008 PM_{2.5} Plan

The expeditious attainment demonstration that supports the District's proposed attainment date is found in Chapter 9 of the Plan and summarized in Table E-1 below. This demonstration has been revised by the updated RFP demonstration in Appendix C of the 2011 Progress Report. *See* Table E-2 below.

Based on this analysis for the annual standard, the District and CARB requested an attainment date extension to April 5, 2015 for both the annual and 24-hour PM_{2.5} standards. *See* SJVUAPCD Governing Board Resolution, p. 4 and CARB Resolution 08-28, p. 4. In its 2011 Progress Report, CARB continues to project April 5, 2015 as the most expeditious attainment date in the SJV. *See* 2011 Progress Report, p. 1.

Table E-1 Expedition Attainment Demonstration for the Annual PM_{2.5} Standard in the San Joaquin Valley (tons per annual average day)						
Year	2009	2010	2011	2012	2013	2014
Baseline NO _x inventory	500.9	469.5	443.3	424.4	393.1	376.2
District commitment	-2.43	-3.24	-4.26	-8.56	-8.82	-8.97
CARB commitment	N/A	N/A	N/A	N/A	N/A	-76.0
Controlled inventory	498.5	466.3	439.0	415.8	384.3	291.2
NO _x emissions level needed for PM _{2.5} attainment	291.2	291.2	291.2	291.2	291.2	291.2
At attainment level?	no	no	no	no	no	yes
Baseline directed-emitted PM _{2.5} inventory	79.8	79.0	77.9	77.0	75.9	75.0
District commitment	-1.60	-2.96	-4.46	-6.69	-6.70	-6.70
CARB commitment	N/A	N/A	N/A	N/A	N/A	-5.0
Controlled inventory	78.2	76.0	73.4	70.3	69.2	63.3
Direct PM _{2.5} emissions level needed for PM _{2.5} attainment	63.3	63.3	63.3	63.3	63.3	63.3
At attainment level?	no	no	no	no	no	yes
Baseline SO ₂ inventory	26.4	23.0	23.3	23.6	23.8	25.5
District commitment	-0.06	-0.11	-0.16	-0.92	-0.92	-0.92
CARB commitment	N/A	N/A	N/A	N/A	N/A	N/A
Controlled inventory	26.3	22.9	23.1	22.7	22.9	24.6
SO ₂ emissions level needed for PM _{2.5} attainment	24.6	24.6	24.6	24.6	24.6	24.6
At attainment level?	no	yes	yes	yes	yes	yes
Overall annual PM _{2.5} standard attainment?	no	no	no	no	no	yes
Projected attainment year/ attainment date	2014/April 5, 2015					

Source: 2008 PM_{2.5} Plan, Table 9-1.

N/A: not applicable. CARB provided commitments to NO_x and PM_{2.5} reductions in 2014 only .

Table E-2 Revised Expeditious Attainment Demonstration for the Annual PM_{2.5} Standard in the San Joaquin Valley (tons per annual average day)				
Year	2009	2012	2013	2014
Baseline NO _x inventory	500.9	424.4	393.1	376.2
District commitments/actual achieved ¹	2.4	11.8	12.4	9.0
Adjustments to baseline ²	117.5	84.6	73.9 ⁵	76
CARB commitment ³	N/A	N/A	N/A	
Controlled inventory ⁴	381	328	306.8	291
NO _x emissions level needed for PM _{2.5} attainment	291.2	291.2	291.2	291.2
At attainment level?	no	no	no	yes
Baseline direct PM _{2.5} inventory	79.8	77.0	75.9	75.0
District commitments ¹	1.6	6.7	6.7	6.7
Adjustments to baseline ²	5.2	1.3	2.0	5.0
CARB commitment ³	N/A	N/A	N/A	
Controlled inventory ⁴	73	69	67.2	63.3
Direct PM _{2.5} emissions level needed for PM _{2.5} attainment	63.3	63.3	63.3	63.3
At attainment level?	no	no	no	yes
Baseline SO ₂ inventory	26.4	23.6	23.8	25.5
District commitments/actual reductions ¹	0.1	3.5	3.6	3.6
Adjustments to baseline ²	3.3	0.1	0.3	0.5
CARB commitment ³	N/A	N/A	N/A	N/A
Controlled inventory ⁴	23.0	20	19.9	21.4
At attainment level?	no	yes	yes	yes
Overall annual PM _{2.5} standard attainment?	no	no	no	yes
Projected attainment year/attainment date	2014/April 5, 2015			

Source: 2008 PM_{2.5} Plan, Table 9-1 and 2011 Progress Report, Appendix C, Table C-1.

N/A: not applicable.

¹. Actual reductions from District rules (without regard to creditability) are used for 2009, 2012, and 2013 if they are higher than the commitment. The 2014 commitment level is used here instead of actual emissions

reductions achieved because any excess reductions from the District's measures count towards meeting CARB's commitment and do not increase the overall emissions reductions. *See* note 3 below.

². Calculated as baseline inventory minus controlled inventory and District commitment. No adjustments are made to the baseline to eliminate uncreditable reductions from Rule 9510.

³. 2007 State Strategy, p. 62. According to the 2007 State Strategy, actual emissions decreases that occur in the San Joaquin Valley that are greater than those from adopted measures may be counted toward meeting CARB's commitments (CARB Resolution 07-28, Attachment B, p. 3); therefore, adjustments to the baseline are counted towards meeting the State's commitment. 2014 figures are CARB's commitment as given on p. 21 of the 2009 State Strategy Status Report.

⁴. 2012 and 2014 numbers are from the 2011 Progress Report, Appendix C, Table C-1. 2013 PM_{2.5} and NO_x numbers are estimated from information in the 2011 Progress Report and additional information provided by the District, *see* SJVUAPCD, Tables 3-1 "Adjusted PM_{2.5} Inventory" and Table 3-2 Adjusted NO_x Inventory," no date.

⁵. Calculated by averaging 2014 adjustments to baseline (63.1 tpd for NO_x and 2.7 tpd for PM_{2.5}, *see* Table F-7) and averaging this result with the adjustment to baseline for 2012. A similar calculation is done for PM_{2.5}, and SO_x.

The 2008 PM_{2.5} Plan does not specifically address the most expeditious date for the attaining the 24-hour PM_{2.5} standard. In reference to attainment of the 24-hour standard, the Plan states:

Attainment of the 24-hour 65 microgram standard is projected to occur prior to 2014 and with fewer reductions required than are needed to attain the annual standard. This means that the annual standard identifies the amount of reductions needed to achieve attainment. CARB used the regional model to evaluate the top 25% of days modeled to provide the annual analysis. Based on design values for 2005, CARB projected a 2014 value of 45 micrograms or less at all sites. Due to concerns that the last two years have experienced slightly higher 24-hour values, the District also performed a screening assessment with estimated design values for 2007 (based on incomplete and uncertified data). Evaluation by the District projected a 2014 value of 53 micrograms. Both of these projections are well below the 65 microgram standard and do not require a weight of evidence evaluation.

2008 PM_{2.5} Plan, p. 3-32.

3. Proposed Actions on the Attainment Date Extension

In 2010, we proposed to not grant the State's request to extend the attainment date for the 1997 PM_{2.5} standards in the SJV to April 5, 2015. This proposal was based primarily on our proposed disapproval of the RACM/RACT demonstration. *See* 75 FR 74518, 74534 and 2010 Proposal TSD, section II.E. As stated in preamble to the PM_{2.5} implementation rule (72 FR 20586, 20601), EPA cannot grant an extension of the attainment date beyond the initial five years provided by section 172(a)(2)(A) if the state has not adequately considered and evaluated the implementation of RACM and RACT in the area. We had proposed to disapprove the RACM/RACT demonstration because of the issues with the air quality modeling and absence of analysis of VOC controls. We noted, however, that given the severity of the PM_{2.5} nonattainment problem in the SJV, an extension of the attainment date would most likely be appropriate and approvable if it were supported by the necessary analysis and part of an attainment plan that meets the applicable statutory and regulatory requirements.

In 2011, we proposed to grant California's request for an attainment date extension to April 5, 2015 for the San Joaquin Valley pursuant to CAA section 172(b)(2). This proposal was based on the severity of the PM_{2.5} air quality in the SJV and our determination that SIP provided for the adoption and expeditious implementation of all reasonably available measures to reduce direct PM_{2.5} and PM_{2.5} precursors and for expeditious attainment of the 1997 PM_{2.5} standards as practicable. *See* 2011 Proposal TSD, section II.E. and 76 FR 41338, 41354.

4. Evaluation and Conclusions

SJV's degree of PM_{2.5} nonattainment can fairly be characterized as severe. The area typically records the highest ambient PM_{2.5} levels in the nation, with 2008-2010 design value for the annual PM_{2.5} levels in urban Bakersfield area of 21.2 µg/m³. *See* EPA, Air Quality Subsystem, Design Value Report, June 1, 2011. The PM_{2.5} problem in the San Joaquin Valley is complex, caused by both direct and secondary PM_{2.5} and compounded by the area's topographical and meteorological conditions that are particularly conducive to the formation and concentration of PM_{2.5}. *See* 2008 PM_{2.5} Plan, Chapter 3.

As discussed in section II.F. below, the District's and State's strategy for attaining the PM_{2.5} standard in the SJV relies on significant reductions of direct PM_{2.5} as well as the PM_{2.5} precursor pollutants NO_x and to a lesser degree SO_x. The State and District have already adopted and are currently implementing a comprehensive set of PM_{2.5}, NO_x, and SO_x control measures. We have found that these rules and programs provide for the implementation of RACM/RACT as required by CAA section 172(c)(1). *See* section II.D. above.

Reductions in direct PM_{2.5} emissions are achieved primarily from control measures on open burning, commercial charbroiling, residential wood combustion, and in-use trucks and buses. These types of control measures present special implementation challenges (e.g., the large number of individuals subject to regulation and the difficulty of applying conventional technological control solutions). Reductions in NO_x emissions come largely from District rules for fuel combustion sources and from the State's mobile source rules. Reductions in SO_x emissions come primarily from controls on combustion sources and glass melting furnaces.

Because of the necessity of obtaining additional emissions reductions from the more challenging-to-control source categories and the need to conduct significant public outreach if applicable control approaches are to be effective, EPA agrees with the District and CARB that the 2008 PM_{2.5} Plan reflects expeditious implementation of these controls during the 2008-2014 time frame. We also agree that the implementation schedule for the District's enhanced stationary source controls is expeditious, taking into account the time necessary for purchase and installation of the required control technologies. Finally, we find that it is not feasible at this time to accelerate the emissions reduction schedule for the State and Federal mobile source control program which must rely on fleet turnover over the years to ultimately deliver the anticipated emissions reductions beyond what is already anticipated from the State's in-use mobile source control and incentive programs.

Given the severity of the PM_{2.5} air quality in the SJV and adoption and expeditious implementation of all reasonably available measures to reduce direct PM_{2.5} and PM_{2.5} precursors, we find that the SJV PM_{2.5} SIP provides for attainment of the 1997 PM_{2.5} standards as expeditiously as practicable. EPA, therefore, grants California's request for an attainment date extension to April 5, 2015 for the San Joaquin Valley pursuant to CAA section 172(b)(2).

We received a number of public comments on our proposal to grant an extension of the attainment date for the 1997 PM_{2.5} standards in the SJV. We have considered these comments and determined that none adversely affect our granting of the extension. We summarize these comments and provide full responses to them in section III.F. of this TSD.

F. Adopted Control Strategy and Enforceable Commitments

1. Requirements for Control Strategies and Enforceable Commitments

CAA section 172(c)(6) requires nonattainment plans to “include enforceable emission limitations, and such other control measures, means or techniques (including economic incentives such as fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such [NAAQS] in such area by the applicable attainment date....” CAA section 110(a)(2)(A), which applies to all SIPs, contains virtual identical language.

The PM_{2.5} implementation rule requires all control measures needed for attainment be implemented as expeditiously as practicable but no later than the beginning of the year prior to the attainment date. 40 CFR § 51.1007(b).

In most instances, a nonattainment plan should include the adopted measures it relies on to demonstrate attainment and RFP and/or meet any other CAA requirement or should identify the adopted measures it relies on that are already SIP approved, federally promulgated, or otherwise SIP creditable. EPA, however, recognizes that circumstances exist that warrant the initial use of enforceable state commitments in place of these adopted measures. We believe that the CAA allows approval of such enforceable commitments as elements of a CAA control strategy requirement when they are limited in scope.

The language in CAA sections 110(a)(2)(A) and 172(c)(6), given above, is quite broad, allowing a SIP to contain any “means or techniques” that EPA determines are “necessary or appropriate” to meet CAA requirements, such that the area will attain as expeditiously as practicable, but no later than the applicable date. Furthermore, the express allowance for “schedules and timetables” demonstrates that Congress understood that all required controls might not have to be in place before a SIP could be fully approved.

Commitments approved by EPA under CAA section 110(k)(3) are enforceable by EPA and citizens under, respectively, CAA sections 113 and 304. In the past, EPA has approved enforceable commitments and courts have enforced actions against states that failed to comply with them.²⁶ Additionally, if a state fails to meet its commitments, EPA could make a finding of failure to implement the SIP under CAA section 179(a)(4), which starts an 18-month period for the state to correct the non-implementation before mandatory sanctions are imposed.

Once EPA determines that circumstances warrant use of an enforceable commitment, EPA considers three factors in determining whether to approve the enforceable commitment: (a) does the commitment address a limited portion of the statutorily-required program; (b) is the state capable of fulfilling its commitment; and (c) is the commitment for a reasonable and appropriate period of time.²⁷

²⁶ See, e.g., *American Lung Ass'n of N.J. v. Kean*, 670 F. Supp. 1285 (D.N.J. 1987), *aff'd*, 871 F.2d 319 (3rd Cir. 1989); *NRDC, Inc. v. N.Y. State Dept. of Env. Cons.*, 668 F. Supp. 848 (S.D.N.Y. 1987); *Citizens for a Better Env't v. Deukmejian*, 731 F. Supp. 1448, *recon. granted in par.*, 746 F. Supp. 976 (N.D. Cal. 1990); *Coalition for Clean Air v. South Coast Air Quality Mgt. Dist.*, No. CV 97-6916-HLH, (C.D. Cal. Aug. 27, 1999).

²⁷ The U.S. Court of Appeals for the Fifth Circuit upheld EPA's interpretation of CAA section 110(a)(2)(A) and 172(c)(6) and the Agency's use and application of the three factor test in approving

2. Control Strategy in the SJV 2008 PM_{2.5} Plan and Revised 2007 State Strategy

For the purposes of evaluating the SJV 2008 PM_{2.5} Plan and 2007 State Strategy, we have divided the measures relied on in the attainment and RFP demonstrations and to meet the RACM/RACT and contingency measures requirements into two categories: baseline measures and control strategy measures.

As the term is used here, baseline measures are federal, State, and District rules and regulations adopted prior to December 2006 (i.e., prior to the development of 2008 PM_{2.5} Plan and 2007 State Strategy) that continue to generate emissions reductions through to the attainment year of 2014 and beyond.²⁸ 2007 State Strategy, Appendix A, p. 1 and 2008 PM_{2.5} Plan, Appendix B, p. B-1. Reductions from these measures are incorporated into the baseline inventory and, for the most part, not individually quantified. These measures provide the majority of emissions reductions needed to attain the PM_{2.5} standards in the SJV. *See* Table G-1 in this TSD.

Control strategy measures are the new rules, rule revisions, commitments, and other adjustments to the inventory that provide the additional increment of emissions reductions needed beyond the baseline measures to demonstrate RFP and attainment, meet RACM/RACT, and/or provide for contingency measures.

We evaluate the control strategy measures in this section. Baseline measures are listed in the Appendices A and B to this TSD.

a. District Control Strategy Measures and Commitments

For the 2008 PM_{2.5} Plan, the District identified and committed to adopting and implementing 13 new control measures for direct PM_{2.5}, NO_x, and/or SO_x. In Table F-1 below, we list these measures, which mostly involve strengthening existing District rules, along with their anticipated and actual adoption, final compliance, and initial implementation dates. As can be seen from Table F-1, the District has mostly met its rulemaking schedule and has only two rule actions remaining.

In Table F-2 below, we list the expected emissions reductions from each measure as given in the 2008 PM_{2.5} Plan; however, we note that the District's commitment is only to the aggregate emissions reductions shown. *See* 2008 PM_{2.5} Plan, p. 6-9 and SJVUAPCD Governing Board Resolution, p. 5. The reductions listed in Table F-2 are those anticipated to be achievable from each rule at the time the 2008 PM_{2.5} Plan was adopted. In Table F-3, we give the current SIP submittal and approval status of the measures in the Plan. In Table F-4, we show the emissions reductions, as updated in the SJV PM_{2.5} Progress Report, for the measures that have been approved or proposed for approval by EPA.

For a number of potential measures identified during the District's RACM analysis, insignificant information was available to evaluate the feasibility of implementing them in the San Joaquin Valley. For these measures, the District developed a schedule for performing feasibility studies. *See* 2008 PM_{2.5} Plan, page 6-13 and Table 6-4. Measures that are identified as

enforceable commitments in the Houston-Galveston ozone SIP. *BCCA Appeal Group et al. v. EPA et al.*, 355 F.3d 817 (5th Cir. 2003).

²⁸ These measures are typically rules that have compliance dates that occur after the adoption date of a plan and mobile source measures that generate reductions through fleet turnover.

being feasible through these studies will be included in future plan updates with schedules and emissions reduction commitments. A list of these studies, their anticipated completion dates, and their current status is given in Table F-6. Additional information on these feasibility studies can be found in the SJV PM_{2.5} Progress Report, Appendix C.

Table F-1
San Joaquin Valley Air Pollution Control District
2008 PM_{2.5} Plan Specific Rule Commitments

Measure Number & Description	District Rule Number	Rule Making Completion Date	Actual Adoption Date	Compliance Date	Actual Compliance Date	Year Reductions Start	Actual Year Reductions Start
S-AGR-1 Open Burning (Phase IV)	4103	2 nd Q – 2010	April 2010	2010	June 2010	2009	2010
S-COM-1 Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	4320	3 rd Q – 2008	October 2008	2012	July 2012 to January 2014	2012	July 2011
S-COM-2 Boilers, Steam Generators and Process Heaters (2 to 5 MMBtu/hr)	4307	3 rd Q – 2008	October 2008	2012	July 2010 to January 2016	2012	July 2010
S-COM-3 Boilers, Steam Generators and Process Heaters (0.075 to < 2 MM Btu/hr)	4308	4 th Q – 2009	December 2009	2011	January 2011	2011	January 2011
S-COM-5 Stationary Gas Turbines	4703	3 rd Q – 2007	September 2007	2012	January 2012	2012	July 2009
S-COM-6 Reciprocating Internal Combustion Engines	4702	4 th Q – 2010	August 2011	2012	January 2014-2017	2012	January 2014
S-COM-7 Glass Melting Furnaces	4354	3 rd Q – 2008	October 2008; Revised September 2010	2009	PM ₁₀ & SO _x – January 2011 NO _x limits – January 2014-2018	2009	PM ₁₀ & SO _x – June 2009 NO _x limits – January 2011
S-COM-9 Residential Water Heaters	4902	1 st Q – 2009	March 2009	Attrition	Attrition	2011	January 2010
S-COM-10 Natural Gas-Fired, Fan Type Residential Central Furnaces	4905	4 th Q – 2014	N/A	Attrition	TBD	2015	TBD
S-COM-14 ¹ Wood Burning Fireplaces and Wood Burning Heaters	4901	3 rd Q – 2009	October 2008	2010	2010	2010	2010
S-IND-9 Commercial Charbroiling	4692	2 nd Q - 2009	September 2009	2011	January 2011	2011	January 2011

Table F-1 San Joaquin Valley Air Pollution Control District 2008 PM_{2.5} Plan Specific Rule Commitments							
Measure Number & Description	District Rule Number	Rule Making Completion Date	Actual Adoption Date	Compliance Date	Actual Compliance Date	Year Reductions Start	Actual Year Reductions Start
S-IND-21 Flares	4311	2 nd Q – 2009	June 2009	2010	July 2011	2010	July 2011
M-TRAN-1 Employer Based Trip Reduction Program	9410	4 th Q – 2009	December 2009	2012	January 2012	2012	January 2012

Source: 2008 PM_{2.5} Plan, Table 6-2, revised June 17, 2010. Anticipated adoption date for Rule 4702, SJVAPCD, District Highlights, June 16, 2011 Actions by the District Governing Board.

¹ Listed as S-COM-11 in Table 6-2 but as S-COM-14 elsewhere in the Plan.

Table F-2 San Joaquin Valley Air Pollution Control District Estimated Emissions Reductions for 2008 PM_{2.5} Plan Specific Rule Commitments Plan Assumptions (tons per average annual day)							
NO _x Emissions Reductions							
		2009	2010	2011	2012	2013	2014
S-AGR-1	4103 - Open Burning (Phase III & IV)	1.21	1.95	2.68	2.67	2.66	2.65
S-COM-1	Rule 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	0	0	0	1.49	1.50	1.52
S-COM-3	4308 - Boilers, Steam Generators and Process Heaters (0.075 to < 2 MMBtu/hr)	0	0	0.12	0.27	0.39	0.55
S-COM-5	4703 - Stationary Gas Turbines	0	0	0	2.21	2.21	2.21
S-COM-7	4354 - Glass Melting Furnaces	1.22	1.25	1.18	1.60	1.67	1.58
S-COM-9	4902 - Residential Water Heaters	0	0	0.20	0.25	0.32	0.40
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0	0.04	0.08	0.07	0.07	0.06
Commitment to Total NO _x Reductions		2.43	3.24	4.26	8.56	8.82	8.97
Direct PM _{2.5} Emissions Reductions							
		2009	2010	2011	2012	2013	2014
S-AGR-1	4103 - Open Burning (Phase III & IV)	1.60	2.57	3.53	3.52	3.50	3.49
S-COM-1	Rule 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	0	0	0	0.23	0.24	0.24
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0	0.39	0.76	0.73	0.71	0.69
S-IND-9	4692 - Commercial Charbroiling	0	0	2.17	2.21	2.25	2.28
Commitment to Total PM _{2.5} Reductions		1.60	2.96	4.46 ¹	6.69	6.70	6.70

Table F-2 San Joaquin Valley Air Pollution Control District Estimated Emissions Reductions for 2008 PM_{2.5} Plan Specific Rule Commitments Plan Assumptions (tons per average annual day)							
SO _x Emissions Reductions							
		2009	2010	2011	2012	2013	2014
S-AGR-1	4103 – Open Burning (Phase III & IV)	0.06 ²	0.10	0.14	0.14	0.14	0.14
S-COM-1	Rule 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr	0	0	0	0.76	0.76	0.76
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0	0.01	0.02	0.02	0.02	0.02
M-TRAN-1	9410 – Employer Based Trip Reduction Programs	TBD	TBD	TBD	TBD	TBD	TBD
Commitment to Total SO ₂ Reductions		0.06	0.11	0.16	0.92	0.92	0.92

Source: 2008 PM_{2.5} Plan, Table 6-3

¹ The value 4.46 is given on Table 6-3b in the 2008 PM_{2.5} Plan. PM_{2.5} reductions expected in 2011, however, sum to 6.46 tpd.

² Value given as 0.03 tpd in Appendix I, page I-4.

Table F-3 Approval and Submittal Status of SJVAPCD Rules in the 2008 PM_{2.5} Plan		
Rule	Submittal and/or Approval Status	Dates and Citations
Rule 4103 - Open Burning (Phase IV)	Approved	Final approval signed September 30 2011
Rule 4307 - Boilers, Steam Generators and Process Heaters (2 to 5 MMBtu/hr)	Approved	75 FR 1715 (January 13, 2010)
Rule 4308 - Boilers, Steam Generators and Process Heaters (0.075 to < 2 MM Btu/hr)	Approved	76 FR 5276 (January 31, 2011)
Rule 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	Approved	76 FR 16696 (March 25, 2011)
Rule 4703 - Stationary Gas Turbines	Approved	74 FR 53888 (October 21, 2009)
Rule 4702 - Reciprocating Internal Combustion Engines (2010 revisions)	Adopted August 2011	Most current revision of rule approved: January 18, 2007 at 73 FR 1819 (January 10, 2008)
Rule 4354 - Glass Melting Furnaces	Approved	76 FR 53640 (August 29, 2011)
Rule 4902 - Residential Water Heaters	Approved	75 FR 24408 (May 5, 2010)
Rule 4905 - Natural Gas-Fired, Fan Type Residential Central Furnaces (2014 revisions)	Adoption scheduled for 2014	Most current revision of rule approved: October 20, 2005 at 72 FR 29886 (May 30, 2007)
Rule 4901 - Wood Burning Fireplaces and Wood Burning Heaters	Approved	74 FR 57907 (November 10, 2009)
Rule 4692 - Commercial Charbroiling	Approved	Final approval signed September 30, 2011
Rule 4311 - Flares	Proposed for approval	Proposal: 76 FR 52623 (August 23, 2011)
Rule 9410 - Employer Based Trip Reduction Program	Action pending	Proposal: action pending Submittal date: May 17, 2010 New rule.

Table F-4 San Joaquin Valley Air Pollution Control District Emissions Reductions from Approved Measures (tons per average annual day)				
NO _x Emissions Reductions				
		2009	2012	2014
S-AGR-1	4103 - Open Burning	1.21	1.87	1.87
S-COM-1	4306 - Boilers - Phase 3 & 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr) ¹	0	(1.58)	(1.60)
S-COM-2	4307 - Boilers, 2 to 5 MMBtu/hr	0	1.25	1.29
S-COM-3	4308 - Boilers, 0.075 to 2 MMBtu/hr	0	0.69	1.45
S-COM-5	4703 - Stationary Gas Turbines	0	2.20	2.20
S-COM-7	4354 - Glass Melting Furnaces	1.22	3.50	3.64
S-COM-9	4902 - Residential Water Heaters	0	0.30	0.50
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0	0.12	0.12
M-TRAN-1	9410 - Employer-Based Trip Reduction ²	0	(0.31)	(0.33)
Total Creditable NO _x Reductions from Approved Measures		2.43	9.93	11.1
Direct PM _{2.5} Emissions Reductions				
		2009	2012	2014
S-AGR-1	4103 - Open Burning	1.60	2.91	2.91
S-COM-1	4306 - Boilers - Phase 3 & 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	0	0.24	0.24
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0	1.15	1.08
S-IND-9	4692 - Commercial Charbroiling ³	0	0.0	0.0

Table F-4 San Joaquin Valley Air Pollution Control District Emissions Reductions from Approved Measures (tons per average annual day)				
M-TRAN-1	9410 - Employer-Based Trip Reduction ²	0	(0.03)	(0.03)
Total PM _{2.5} Reductions from Approved Measures		1.6	4.30	4.23
SO _x Emissions Reductions				
		2009	2012	2014
S-AGR-1	4103 - Open Burning	0.05	0.05	0.05
S-COM-1	4306 - Boilers - Phase 3 & 4320 - Advanced Emissions Reductions for Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	0	1.92	1.92
S-COM-7	4354 - Glass Melting Furnaces	0	1.49	1.62
S-COM-14	4901 - Wood Burning Fireplaces and Wood Burning Heaters	0.01	0.02	0.02
Total SO ₂ Reductions from Approved Measures		0.06	3.48	3.61

Source: SJVUAPCD, "Table 3-1 Adjusted PM_{2.5} Emission Inventory; Table 3-2 Adjusted NO_x Emission Inventory; and Table 3-3 Adjusted SO_x Emission Inventory," March 2011, available in the docket for this rule. All reductions are based on the Plan's emissions inventory.

¹ NO_x reductions from Rule 4320 are not currently SIP creditable. See EPA's approval of the rule at 76 FR 16696 (March 25, 2011)

² Because Rule 9410 has not been proposed for approval, reductions from this rule are not included in the totals reductions listed.

³ Erroneous value given in SJVUAPCD tables.

Table F-5 San Joaquin Valley Air Pollution Control District 2008 PM_{2.5} Plan Feasibility Studies			
Measure Number & Description	District Rule Number	Anticipated Study Completion Date	Status
S-AGR-2 Conservation Management Practices	4550	2010	On-going through 2011. Study currently focused on refining estimates of direct PM _{2.5} from sources covered by this rule.
S-COM- 4 Solid Fuel Boilers, Steam Generators and Process Heaters (> 5 MMBtu/hr)	4352	2009	Completed. Study found additional controls are technologically feasible to further reduce NO _x . District will evaluate various control options during rule revisions in 2011.
S-COM-6A Small Spark-Ignited Engines and Agricultural Spark-Ignited Engines	4702	2008	Completed. Rule revisions are currently under development. Adoption expected August 2011.
S-COM-8 Lime Kilns	4313	2011	Completed. Study found that there are no lime kilns currently operating in the SJV.
S-COM-11 Dryers	4309	2011	Continuing through 2011. Several options for rule revisions are being considered.
S-GOV-6 Prescribed Burning	4106	2008	Feasibility study completed. Based on results of the study, District is seeking legislative changes to raise priority of air quality related health concerns in decision making on prescribed burning. District has also developed a comprehensive outreach program and participates in daily coordination calls with agencies involved in prescribed burning.
S-IND-8 Cotton Gins	4204	2009	On-going through 2012. Completion delayed pending results from the national cotton gin particulate matter emissions study.
S-IND-4 Fugitive PM ₁₀ Prohibitions	Reg. VIII	2009	On-going through 2011. Study currently focused on refining estimates of direct PM _{2.5} from sources covered by this regulation.
M-OTH-8 Indirect Source Review Enhancement	9510	2010	Completed. Study concluded that no rules revisions are needed at this time.
M-OTH-10 Fireworks	—	2012	On-going through 2012. Study is looking at legal limitations and potential future control options.

Source: 2008 PM_{2.5} Plan, Table 6-4 and SJV PM_{2.5} Progress Report, Appendix C.

b. CARB Measures and Commitments

The 2007 State Strategy includes a commitment by CARB to propose new defined measures. 2007 State Strategy, p. 62 and CARB Resolution 7-28, Attachment B, p. 8 and 2011 Progress Report, Appendix B. Table F-6 below lists these defined measures and their current adoption and approval status. As can be seen from this table, the State has already adopted and EPA has approved or proposed to approve, or is in the process of granting waivers under CAA section 209 to most of these measures. These new measures build on the State's already extensive list of adopted measure; a list of which can be found in the 2007 State Strategy (p. 38) and in Appendix A of this TSD.

In addition to the State's commitment to propose specific measures, the 2007 State Strategy includes an enforceable commitment for emissions reductions sufficient in combination with existing measures and the District's commitments to attain the PM_{2.5} NAAQS in the San Joaquin Valley by the requested attainment date of April 5, 2015. For the SJV, the 2007 State Strategy included a State commitment to achieve 5 tpd of direct PM_{2.5} and 76 tpd of NO_x in the SJV by 2014. *See* 2007 State Strategy, p. 63 and CARB Resolution 07-28, Attachment B, p. 6. The nature of this commitment is described in the State Strategy as follows:

The total emission reductions from the new measures necessary to attain the federal standards are an enforceable State commitment in the SIP. While the proposed State Strategy includes estimates of the emission reductions from each of the individual new measures, it is important to note that the commitment of the State Strategy is to achieve the total emission reductions necessary to attain the federal standards, which would be the aggregate of all existing and proposed new measures combined. Therefore, if a particular measure does not get its expected emission reductions, the State still commits to achieving the total aggregate emission reductions, whether this is realized through additional reductions from the new measures or from alternative control measures or incentive programs. If actual emission decreases occur in any air basin for which emission reduction commitments have been made that are greater than the projected emissions reductions from the adopted measures in the State Strategy, the actual emission decreases may be counted toward meeting ARB's total emission reduction commitments.

CARB Resolution 07-28 (September 27, 2007), Appendix B, p. 3.

The 2011 Progress Report further discusses this commitment:

When ARB adopted the 2007 State Strategy as a SIP revision, the State of California made a legal commitment, required by the Clean Air Act and enforceable in federal court, to reduce emissions to the levels necessary for attainment. ARB specifically identified several ways this emission reduction commitment could be achieved:

- New measures as described in the SIP
- Other alternative measures that ARB had not considered at the time the SIP was adopted
- Incentive programs that support the replacement or retrofit of aging, higher polluting pieces of equipment
- Actual emission decreases

2011 Progress Report, p. 4.

As described in section II.A.3. of this TSD, CARB has adjusted baseline emissions estimates for source categories subject to its recently-revised in-use rules. Table F-7 shows original and adjusted baseline emissions inventories for the source categories. The adjustments to the inventories show the effect of the recent economic recession and, for some source categories, changes to inventory methodologies. Table F-8 lists the emissions reductions (from the adjusted baseline emissions inventories) that the State now estimates it will achieve from its measures as adopted or revised and which are currently creditable to decrease CARB's commitment.

Table F-6 2007 State Strategy Defined Measures Schedule for Consideration and Current Status		
State Measures	Expected Action Year	Current Status
Smog Check Improvements	2007-2009	Approved 75 FR 38023 (July 1, 2010) ²⁹
Expanded Vehicle Retirement (AB 118)	2007	Adopted by CARB, June 2009; by BAR, September 2010.
Modification to Reformulated Gasoline Program	2007	Approved, 75 FR 26653 (May 12, 2010)
Cleaner In-Use Heavy Duty Trucks	2008	Proposed for approval 76 FR 40652 (July 11, 2011).
Accelerated Introduction of Cleaner Locomotives	2008	Prop 1B bond funds awarded to upgrade line-haul locomotive engines not already accounted for by enforceable agreements with the railroads. Those cleaner line-hauls will begin operation by 2012.
Cleaner In-Use Off-Road Engines	2007, 2010	Waiver action pending.
New Emissions Standards for Recreational Boats	2013	Additional action expected 2013.

Source: 2011 Progress Report, Table B-1. Additional information from www.ca.arb.gov. Only defined measures with PM_{2.5}, or NO_x reductions in the SJV are shown here.

²⁹ California Assembly Bill 2289, passed in 2010, requires the Bureau of Automotive Repair to direct older vehicles to high performing auto technicians and test stations for inspection and certification effective 2013. Reductions shown for the SmogCheck program in the 2011 Progress Report and this TSD do not include reductions from AB 2289 improvements. CARB Progress Report supplement, attachment 5.

Table F-7
Original and Adjusted Baseline Emissions Inventories
By State Measure
(tons per day, 2014)

State Measure	Direct PM _{2.5}			NO _x			SO _x		
	Original	Adjusted	Change	Original	Adjusted	Change	Original	Adjusted	Change
Smog Check Improvements (BAR)	2.5	2.5	0.0	41	41.2	+0.2	–	–	–
Cleaner In-Use Heavy-Duty Trucks & Buses	6.2	4.3	-1.9	156.9	111.3	-45.6	0.3	0.2	-0.1
Accelerated Intro. Of Cleaner Line-Haul Locomotives	0.5	0.5	0.0	19.9	19.9	0.0	–	–	–
Cleaner In-Use Off-Road Equipment (>25hp)	1.4	0.6	-0.8	31.4	13.7	-17.7	0.0	0.0	0.0
New Emission Standards for Recreational Boats	–	–	–	3.5	3.5	0.0	–	–	–
All Other Measures	64 ¹	64 ¹	0.0	123.0	123.0	0.0	24 ²	24 ²	0.0
Totals:	74.6	71.9	-2.7	375.7	312.6	-63.1	24.3	24.2	-0.1

Source: 2011 Progress Report, Appendix E, p. 4.

¹ Includes emissions from recreational boats.

² Includes emissions from all sources categories except for those subject to the Truck & Bus and Off-Road Equipment Rules

Table F-8 Creditable Emissions Reductions from Defined Measures for the San Joaquin Valley (tons per day 2014)		
State Measure	Direct PM _{2.5}	NO _x
Smog Check Improvements (BAR)	0.1	0.7
Expanded Vehicle Retirement	—	—
Cleaner In-Use Heavy-Duty Trucks	1.7	1.1
Accelerated Intro. Of Cleaner Line-Haul Locomotives	0.0	0.0
Cleaner In-Use Off-Road Equipment (>25hp)	0.0	0.3
New Emission Standards for Recreational Boats	—	—
Totals:	1.8	2.1

Source: 2011 Progress Report, Appendix E, p. 4. Only defined measures with PM_{2.5}, or NO_x reductions in the SJV are shown here. Note: The 2007 State Strategy did not include SO_x reductions for the SJV.

3. Proposed Actions on the Control Strategy and Enforceable Commitments

In our 2010 proposed action, we found that circumstances warranted the consideration of enforceable commitments as part of the SJV PM_{2.5} SIP's attainment demonstration. We also found that both the State and the District had demonstrated the capability to meet their commitments. We did not find, however, that the commitments constituted a limited portion of the required emissions reductions needed for attainment. The State's and District's unfulfilled commitments at the time of our 2010 proposal represent 41 percent of the PM_{2.5} reductions, 28 percent of the NO_x reductions, and 44 percent of the SO_x emissions reductions estimated to be needed for attainment. We also found that the commitments, which were for the most part to achieve the reductions by 2014, were not for an appropriate timeframe given that we were proposing to not grant the State's request to extent the applicable attainment date from 2010 to 2015. 75 FR 74518, 74535 and 2010 Proposal TSD, section II.F. Because we could not make two of the necessary findings, we were unable to propose to approve the attainment demonstration that relied in part on these commitments. We did, however, propose to approve SJVUAPCD's and CARB's commitments to adopt and implement specific control measures on the schedule identified in their plans and to achieve the aggregate emissions reductions identified in their plans because they would strengthen the California SIP.

In our 2011 proposed action, we again found that circumstances warranted the consideration of enforceable commitments as part of the SJV PM_{2.5} SIP's attainment demonstration. We also found again that both the State and the District had demonstrated the capability to meet their commitments. Based on revisions to the SIP submitted in 2011 and our proposed approval of the Truck Rule, we found that the commitments constituted a limited

portion of the required emissions reductions needed for attainment. The State's and District's unfulfilled commitments at the time of our 2011 proposal represent approximately 13 percent of the direct PM_{2.5} and 4.5 percent of the NO_x needed to attain the 1997 PM_{2.5} standards in the SJV. We also proposed to find that the commitments were for an appropriate timeframe given that we were proposing to grant the State's request to extend the applicable attainment date from 2010 to 2015. 76 FR 41338, 41356 and 2011 Proposal TSD, section II.F. Based on these proposed findings, we proposed to approve the attainment demonstration that relied in part on these commitments.

We also again proposed to approve SJVUAPCD's and CARB's commitments to adopt and implement specific control measures on the schedule identified in their plans and to achieve the aggregate emissions reductions identified in their plans. We did propose to disapprove the District's commitment to adopt revisions to Rule 4702 by December 2010 because that date had passed and the District has not adopted revisions to the rule. We stated that should the District adopt revision to the rule by the time of EPA's final action on the Plan, EPA would take no action on the commitment because it will have already been fulfilled.

4. Evaluation and Conclusions

a. Baseline and Control Strategy Measures

As shown in Table F-9, the majority of the emissions reductions needed to demonstrate attainment come from baseline measures. These reductions come from a combination of District and State measures as well as adjustments to the baseline that reflect revisions to the economic forecasts that underlie the Plan's estimates of future emissions levels.³⁰

In the past two decades, the District has adopted or revised almost 40 prohibitory rules that limit emissions of NO_x, SO_x and/or particulate matter including most of the rule adoptions/revisions it committed to as part of the 2008 PM_{2.5} Plan. *See* Appendix B and Table F-3. These rules include controls for boilers, fugitive dust sources, engines, woodburning, and open burning. The great majority of these rules and rule revisions are currently SIP approved and as such their emissions reductions are fully creditable in attainment and RFP demonstrations and for other CAA requirements, such as contingency measures.

The 2005 baseline inventory includes uncreditable reductions from the District's Rule 9510-Indirect Source Review (4.2 tpd NO_x). 2008 PM_{2.5} Plan, Appendix B, Table B-2. While EPA has approved the rule into the California SIP, it is not currently allowing emissions reductions credits from the rule to be relied on for SIP planning purposes. 76 FR 26609 (May 9, 2011). In our evaluation of the RFP and attainment demonstrations, we have exclude reductions from this rule.

³⁰ Reductions in the baseline also come from federal measures. These federal measures include EPA's national emissions standards for heavy duty diesel trucks (66 FR 5001 (January 18, 2001)), certain new construction and farm equipment (Tier 2 and 3 non-road engines standards, 63 FR 56968 (October 23, 1998) and Tier 4 diesel non-road engine standards, 69 FR 38958 (June 29, 2004)), and locomotives (63 FR 18978 (May 16, 1998) and 73 FR 37045 (June 30, 2008)). States are allowed to rely on reductions from federal measures in attainment and RFP demonstrations and for other SIP purposes.

Table F-9 Summary of Reductions Needed for SJV's PM_{2.5} Attainment Demonstration (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO ₂
A	2005 baseline emissions level	86.0	575.4	26.4
B	2014 attainment target level	63.3	291.2	24.6
C	Total reductions needed from 2005 baseline levels to attain in 2014 (A – B)	22.7	284.2	1.8
D	Unadjusted 2014 baseline emissions level	75.0	376.2	25.5
E	Adjustment to 2014 baseline emissions level	2.7	63.1	0.1
F	Uncreditable reductions from Rule 9510 in the 2014 baseline	–	4.2	–
G	Adjusted 2014 baseline emissions level (D–E+F)	72.3	317.3	25.4
H	Reductions from baseline measures (A-G)	13.7	258.1	1.0
I	Percent of reductions needed for attainment from baseline measures	60.4%	90.8%	56%
J	Reductions needed from control strategy measures (C-H)	9.0	26.1	0.8
K	Percent of reductions needed for attainment from control strategy measures	39.6%	9.2%	44%

California has adopted standards for many categories of on- and off-road vehicles and engines, gasoline and diesel fuels, and numerous categories of consumer products. The State's measures fall within two categories: measures for which the State has obtained or has applied to obtain a waiver of federal pre-emption under CAA section 209 ("section 209 waiver measure" or "waiver measure") and those for which the State is not required to obtain a waiver ("non-waiver measure"). See EPA's proposed approval and final approval of the SJV 1-Hour Ozone Plan at 74 FR 33933, 33938, (July 14, 2009) and 75 FR 10420, 10424 (March 8, 2010).³¹

i. Section 209 Waiver Measures

A waiver under CAA section 209 is, in general, required for most of California's on- and non-road vehicle or engine standards. Examples of State waiver measures are: low emission

³¹ EPA position is also discussed in Brief of Respondents, *Sierra Club, et al., And Committee for a Better Arvin, et al. v. United States Environmental Protection Agency, et al.*, United States Court of Appeals for the Ninth Circuit, Case Nos. 10-71457 and 10-71458, May 5, 2011, pp. 33-44.

vehicle program, heavy duty bus standards, and small off-road engine standards. A list of California's waiver measures can be found in the Appendix A of this TSD.

California's motor vehicle emissions control program predates the first federal statute regulating motor vehicle emissions, the Motor Vehicle Air Pollution Control Act of 1965 (which amended the CAA of 1963). In further CAA amendments, referred to as the Air Quality Act of 1967 (Pub. L. 90-148), Congress allowed the State of California, and only California, a waiver of the Air Quality Act's pre-emption of state emissions standards for new motor vehicles or new motor vehicle engines because of California's pioneering efforts and unique problems. This was not changed when the statute was amended in 1970. The 1977 amendments to the CAA expanded the flexibility granted to California in order "to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare." (H.R. Rep. No. 294, 95th Congr., 1st Sess. 301-2 (1977)). So long as California determines that its motor vehicle standards are "in the aggregate" at least as protective of public health and welfare as applicable federal standards, title II of the CAA requires EPA, unless it makes certain findings, to waive the Act's general prohibition on state adoption and enforcement of standards relating to the control of emissions from new motor vehicles or new motor vehicle engines. *See* CAA section 209, subsections (a) and (b).

As part of the 1990 Amendments to the CAA, Congress enacted subsection (e) of section 209. In nearly identical language to subsections (a) and (b) of section 209, subsection (e) sets forth the federal pre-emption of state emissions standards for non-road vehicles or engines but allows the State of California, and only California, a waiver of pre-emption (with certain exceptions) under criteria that mirror the section 209(b) waiver provisions for motor vehicles.

In EPA's review of the California SIP and its many revisions, EPA has historically allowed emissions reduction credit for the motor vehicle emissions standards that are subject to a section 209(b) waiver without requiring California to submit the standards themselves to EPA for approval as part of the California SIP. In this respect, EPA treated these rules similarly to the federal motor vehicle control requirements, which EPA has always allowed states to credit in their SIPs without submitting the program as a SIP revision. Since 1990, EPA has treated California non-road standards for which EPA has issued waivers in the same manner as California motor vehicle standards, i.e., allowing credit for standards subject to the waiver process without requiring submittal of the standards as part of the SIP. In so doing, EPA has treated the California non-road standards similarly to the Federal non-road standards, which are relied upon, but not included in, various SIPs.

Credit for Federal measures, including those that establish on-road and non-road standards, notwithstanding their absence in the SIP, is justified by reference to CAA section 110(a)(2)(A), which establishes the following content requirements for SIPs: "... enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), ... , as may be *necessary or appropriate* to meet the applicable requirements of this chapter." (emphasis added). Federal measures are permanent, independently enforceable (by EPA and citizens), and quantifiable without regard to whether they are approved into a SIP, and thus EPA has never found such measures to be "necessary or appropriate" for inclusion in SIPs to meet the applicable requirements of the Act. Section 209 of the CAA establishes a process under which EPA allows California's waiver measures to substitute for Federal measures, and like the Federal measures for which they substitute, EPA has historically found, and continues to find, based on

considerations of permanence, enforceability, and quantifiability, that such measures are not “necessary or appropriate” for California to include in its SIP to meet the applicable requirements of the Act.

First, with respect to permanence, we note that, to maintain a waiver, CARB’s on-road waiver measures can be relaxed only to a level of aggregate equivalence to the Federal Motor Vehicle Control Program (FMVCP). *See* section 209(b)(1). In this respect, the FMVCP acts as a partial backstop to California’s on-road waiver measures (i.e., absent a waiver, the FMVCP would apply in California). Likewise, Federal non-road vehicle and engine standards act as a partial backstop for corresponding California non-road waiver measures. The constraints of the waiver process thus serve to limit the extent to which CARB can relax the waiver measures for which there are corresponding EPA standards, and thereby serve an anti-backsliding function similar in substance to those established for SIP revisions in CAA sections 110(l) and 193. Meanwhile, the growing convergence between California and EPA mobile source standards diminishes the difference in the emissions reductions reasonably attributed to the two programs and strengthens the role of the Federal program in serving as an effective backstop to the State program. In other words, with the harmonization of EPA mobile source standards with the corresponding State standards, the Federal program is becoming essentially a full backstop to most parts of the California program.

Second, as to enforceability, we note that the waiver process itself bestows enforceability onto California to enforce the on-road or non-road standards for which EPA has issued the waiver. CARB has as long a history of enforcement of vehicle/engine emissions standards as EPA, and CARB’s enforcement program is equally as rigorous as the corresponding EPA program. The history and rigor of CARB’s enforcement program lends assurance to California SIP revisions that rely on the emissions reductions from CARB’s rules in the same manner as EPA’s mobile source enforcement program lends assurance to other state’s SIPs in their reliance on emissions reductions from the FMVCP. While it is true that citizens and EPA are not authorized to enforce California waiver measures under the Clean Air Act (i.e., because they are not in the SIP), citizens and EPA are authorized to enforce EPA standards in the event that vehicles operate in California without either California or EPA certification,

As to quantifiability, EPA’s historical practice has been to give SIP credit for motor-vehicle-related waiver measures by allowing California to include motor vehicle emissions estimates made by using California’s EMFAC (and its predecessors) motor vehicle emissions factor model in SIP inventories. EPA verifies the emissions reductions from motor-vehicle-related waiver measures through review and approval of EMFAC, which is updated from time to time by California to reflect updated methods and data, as well as newly-established emissions standards. (Emissions reductions from EPA’s motor vehicle standards are reflected in an analogous model known as MOBILE.) The EMFAC model is based on the motor vehicle emissions standards for which California has received waivers from EPA but accounts for vehicle deterioration and many other factors. The motor vehicle emissions estimates themselves combine EMFAC results with vehicle activity estimates, among other considerations. *See* the 1982 Bay Area Air Quality Plan, and the related EPA rulemakings approving the plan (*see* 48 FR 5074 (February 3, 1983) for the proposed rule and 48 FR 57130 (December 28, 1983) for the final rule) as an example of how the waiver measures have been treated historically by EPA

in California SIP actions.³² The San Joaquin Valley plan was developed using a version of the EMFAC model referred to as EMFAC2007, which EPA has approved for use in SIP development in California. *See* 73 FR 3464 (January 18, 2008). Thus, the emissions reductions that are from the California on-road “waiver measures” and that are estimated through use of EMFAC are as verifiable as are the emissions reductions relied upon by states other than California in developing their SIPs based on estimates of motor vehicle emissions made through the use of the MOBILE model.

Moreover, EPA’s waiver review and approval process is analogous to the SIP approval process. First, CARB adopts its emissions standards following notice and comment procedures at the state level, and then submits the rules to EPA as part of its waiver request. When EPA receives new waiver requests from CARB, EPA publishes a notice of opportunity for public hearing and comment and then publishes a decision in the Federal Register following the public comment period. Once again, in substance, the process is similar to that for SIP approval and supports the argument that one hurdle (the waiver process) is all Congress intended for California standards, not two (waiver process plus SIP approval process). Second, just as SIP revisions are not effective until approved by EPA, changes to CARB’s rules (for which a waiver has been granted) are not effective until EPA grants a new waiver, unless the changes are “within the scope” of a prior waiver and no new waiver is needed. Third, both types of final actions by EPA—i.e., final actions on California requests for waivers and final actions on state submittals of SIPs and SIP revisions—may be challenged under section 307(b)(1) of the CAA in the appropriate United States Court of Appeals.

Further statutory support for EPA’s long-standing practice is found in CAA section 193. CAA section 193, enacted as part of the 1990 Amendments to the CAA, is a general savings clause that provides for, among other things, EPA statutory interpretations that predate those amendments to remain in effect so long as not inconsistent with the Act. At the time it enacted section 193, Congress did not insert any language into the statute rendering EPA’s consistent prior treatment of California’s motor vehicle standards inconsistent with the Act. Moreover, where Congress intends state control measures that are otherwise pre-empted under title II of the Clean Air Act to be incorporated into SIPs, it has required that explicitly. *See, e.g.*, section 211(c)(4)(C) (State fuels regulations), section 211(m) (oxygenated gasoline regulations), and

³² EPA’s historical practice in allowing California credit for waiver measures notwithstanding the absence of the underlying rules in the SIP is further documented by reference to EPA’s review and approval of a May 1979 revision to the California SIP entitled, “Chapter 4, California Air Quality Control Strategies.” In our proposed approval of the 1979 revision (44 FR 60758, October 22, 1979), we describe the SIP revision as outlining California’s overall control strategy, which the State had divided into vehicular sources and non-vehicular (stationary source) controls. As to the former, the SIP revision discusses vehicular control measures as including technical control measures and transportation control measures. The former refers to the types of measures we refer to herein as waiver measures, as well as fuel content limitations, and a vehicle inspection and maintenance program. The 1979 SIP revision included several appendices, including appendix 4–E, which refers to “ARB vehicle emission controls included in title 13, California Administrative Code, chapter 3 * * *,” including the types of vehicle emission standards we refer to herein as waiver measures; however, California did not submit the related portions of the California Administrative Code (CAC) to EPA as part of the 1979 SIP revision submittal. With respect to the CAC, the 1979 SIP revision states: “The following appendices are portions of the California Administrative Code. Persons interested in these appendices should refer directly to the code.” Thus, the State was clearly signaling its intention to rely on the California motor vehicle control program but not to submit the underlying rules to EPA as part of the SIP. In 1980, we finalized our approval as proposed. *See* 45 FR 63843 (September 26, 1980).

section 246 (centrally fueled fleets). Thus, in section 193, Congress effectively ratified EPA's longstanding pre-1990 practice of allowing emissions reduction credit for California standards subject to the waiver process notwithstanding the absence of the standards in the SIP itself.

As noted above, under the CAA Amendments of 1990, Congress enacted subsection (e) of section 209. In nearly identical language to subsections (a) and (b) of section 209, subsection (e) sets forth the federal pre-emption of state emissions standards for non-road vehicles or engines but allows the State of California, and only California, a waiver of pre-emption (with certain exceptions) under criteria that mirror the section 209(b) waiver provisions for motor vehicles. Congress is presumed to be aware of agency interpretations and its subsequent revision of the statute to add subsection (e) without overruling EPA's interpretation with respect to motor vehicle standards is further compelling evidence that the Agency correctly interpreted congressional intent with respect to crediting California requirements subject to a section 209 waiver without requiring California to submit the standards themselves to EPA for approval as part of the California SIP.

We believe that section 193 of the CAA, the general savings clause added by Congress in 1990, effectively ratified our long-standing practice of granting credit for the California waiver rules because Congress did not insert any language into the statute rendering EPA's treatment of California's motor vehicle standards inconsistent with the Act. Rather, Congress extended the California waiver provisions to most types of non-road vehicles and engines, once again reflecting Congressional intent to provide California with the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare. Requiring the waiver measures to undergo SIP review in addition to the statutory waiver process is not consistent with providing California with the broadest possible discretion as to on-road and non-road vehicle and engine standards, but rather, would add to the regulatory burden California faces in establishing and modifying such standards, and thus would not be consistent with Congressional intent. In short, we believe that Congress intended California's mobile source rules to undergo only one EPA review process (i.e., the waiver process), not two. Even if section 193 did not provide congressional acquiescence as to EPA's treatment of the standards, the Act's structure, evolution, and provision for the waiver of Federal pre-emption for California mobile source emissions standards, as discussed above, support EPA's long-standing interpretation of the CAA to allow California to rely on emissions reductions resulting from waiver measures in SIPs, notwithstanding the waiver measures' absence from the SIP itself.

ii. Non-waiver measures

These measures include improvements to California's inspection and maintenance (I/M) program, SmogCheck, and cleaner burning gasoline and diesel regulations. A list of these non-waiver measures, many of which have been SIP approved, can be found Appendix A.

b. Enforceable Commitments

As shown in Table F-10 below, reductions in the projected baseline inventory resulting from the economic recession, changes to activity estimates and other revisions to the emissions inventory, and measures already adopted by the District and State (both prior to and pursuant to the 2008 PM_{2.5} Plan) and approved or proposed for approval by EPA provide more than 90 percent of the emissions reductions needed to demonstrate attainment of the 1997 PM_{2.5} standards in the SJV. The balance of the needed reductions is in the form of enforceable

commitments by the District and CARB. Tables F-11 and F-12 show the District and CARB's commitments.

We believe that, with respect to the 2008 SJV PM_{2.5} SIP, circumstances warrant the consideration of enforceable commitments as part of the attainment demonstration for the SJV. As shown in Table F-9 above, the majority of emissions reductions needed to demonstrate attainment and RFP in the SJV come from rules and regulations that were adopted prior to 2007, i.e., they come from the baseline measures. As a result of these State and District efforts, most sources in the San Joaquin Valley nonattainment area were already subject to stringent rules prior to State Strategy's and the Plan's development, leaving fewer and more technologically challenging opportunities to reduce emissions. In the 2008 PM_{2.5} Plan and the 2007 State Strategy, the District and CARB identified potential control measures that could achieve the additional emissions reductions needed for attainment. *See* 2008 PM_{2.5} Plan, Appendix I and 2007 State Strategy, Chapter 5. However, the timeline needed to develop, adopt, and implement these measures went many years beyond the April 5, 2008³³ deadline to submit the PM_{2.5} attainment plan. As discussed above, the District and State have made progress meeting their commitments but have not completely fulfilled them. Given these circumstances, we consider the District's and CARB's reliance in the 2008 PM_{2.5} Plan and 2007 State Strategy on enforceable commitments to be warranted.

Having concluded that the use of enforceable commitment is warranted, we now consider the three factors EPA uses to determine whether the use of enforceable commitments in lieu of adopted measures to meet a CAA planning requirements is approvable: (a) does the commitment address a limited portion of the statutorily-required program; (b) is the state capable of fulfilling its commitment; and (c) is the commitment for a reasonable and appropriate period of time.

³³ The 2007 State Strategy was developed to address both the 1997 PM_{2.5} NAAQS and the 1997 8-hour Ozone NAAQS. The 8-hour ozone SIPs were due in November 2007, and the development and adoption of the State Strategy was timed to coordinate with this submittal date. 2007 State Strategy, p. 1.

Table F-10 Reductions Needed for Attainment Remaining as Commitments based on SIP-Creditable Measures (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO _x
A	Total reductions needed from baseline and control strategy measures to attain	22.7	284.2	1.8
B	Adjustments to the baseline and reductions from baseline measures and (Table F-9)	13.7	258.1	1.0
C	Total reductions from approved/proposed for approval measures (Tables F-4 and F-8)	6.0	13.2	3.6
D	Total reductions remaining as commitments (A-B-C) ¹	3.0	12.9	0.0
	Percent of total reductions needed remaining as commitments	13.2%	4.5%	0.0%

Table F-11 Emissions Reductions Remaining as District Commitments based on SIP-Creditable Measures (tons per average annual day in 2014)			
	Direct PM _{2.5}	NO _x	SO _x
Total District commitments (Table F-2)	6.7	9.0	0.9
Total reductions from approved District measures (Table F-4)	4.2	11.1	3.6
Total reductions remaining as District commitments	2.5	0	0

Table F-12 Emissions Reductions Remaining as CARB Commitments based on SIP-Creditable Measures (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO ₂
A	Reductions needed from control strategy measures (Table F-9, line J)	9.0	26.1	0.8
B	District commitments (Table F-2)	6.7	9.0	0.9
C	CARB commitments (A-B)	2.3	17.1	--
D	Total reductions from approved or proposed for approval State measures	1.8	2.1	--
E	Total reductions remaining as CARB commitments (C-)	0.5	15.0	--

i. The Commitment is a Limited Portion of Required Reductions

For the first factor, we look to see if the commitment addresses a limited portion of a statutory requirement, such as the amount of emissions reductions needed for attainment in a nonattainment area.

As shown in Table F-10, the remaining portion of the enforceable commitments after accounting for approved and proposed for approval measures as well as adjustments to the baseline that resulted from the recent economic recession, are 3.0 tpd direct PM_{2.5} and 12.9 tpd NO_x. When compared to the total reductions needed by 2014 for PM_{2.5} attainment in the SJV on a per-pollutant basis, these commitments represents approximately 13 percent of the direct PM_{2.5} and 4.5 percent of the NO_x needed to attain the 1997 PM_{2.5} standards in the SJV.

We believe that the reductions remaining as enforceable commitments in the 2008 PM_{2.5} Plan and 2007 State Strategy represent a limited portion of the total emissions reductions needed to meet the statutory requirement for attainment in the SJV and therefore satisfy the first factor. The level of reductions remaining as commitments is reasonable close to the 10 percent range that EPA has historically accepted in approving attainment demonstrations.³⁴

ii. The State is Capable of Fulfilling Its Commitment

For the second factor, we consider whether the State and District are capable of fulfilling their commitments.

As discussed above, CARB has adopted and submitted a 2009 State Strategy Status Report and a 2011 Progress Report which update and revise the 2007 State Strategy. These

³⁴ See, for example, our approval of the SJV PM₁₀ Plan at 69 FR 30005 (May 26, 2004), the SJV 1-hour ozone plan at 75 FR 10420 (March 8, 2010), and the Houston-Galveston 1-hour ozone plan at 66 FR 57160 (November 14, 2001).

reports show that CARB has made significant progress in meeting its enforceable commitments for the San Joaquin Valley and several other nonattainment areas in California. Additional on-going program that address locomotives and in-use agricultural equipment have yet to be quantified but are expected to reduce NO_x and direct PM_{2.5} emissions in the SJV by 2014.³⁵

The District has already exceeded its commitments for reducing NO_x and SO_x emissions and has substantially met its commitment to reduce direct PM_{2.5} emissions. *See* Table F-111. It also has already adopted rules (Rules 9510 and 4320) that are projected to achieve NO_x reductions of 5.8 tpd in 2014. These reductions, however, are not currently creditable to the attainment and RFP demonstrations. *See* Tables F-4 and F-9. It is also continuing to work to identify and adopt additional measures to reduce emissions. Table F-5 in this TSD describes a number of the feasibility studies currently underway at the District.

Beyond the rules discussed above, both CARB and the District have well-funded incentive grant programs to reduce emissions from the on- and off-road engine fleets. Reductions from several of these programs have yet to be quantified and/or credited in the attainment demonstration. *See*, for example, SJV PM_{2.5} Progress Report, section 2.3

Finally, the SJV is designated nonattainment for the 2006 24-hour PM_{2.5} standard. The State must submit a plan to address attainment of that standard is by December 2012. 74 FR 58688, 58689 (November 13, 2009).

Given the evidence of the State's and District's efforts to date and their continuing efforts to reduce emissions, we believe that the State and District are capable of meeting their enforceable commitments to reduce emissions of direct PM_{2.5} and NO_x by 2014 to the levels needed to attain the 1997 PM_{2.5} standards in the San Joaquin Valley by 2014.

iii. The Commitment is for a Reasonable and Appropriate Timeframe

For the third and last factor, we consider whether the commitment is for a reasonable and appropriate period of time.

In order to meet the commitments to reduce emissions to the levels needed to attain the 1997 PM_{2.5} standards in the San Joaquin Valley, the 2008 PM_{2.5} Plan and 2007 State Strategy included an ambitious rule development, adoption, and implementation schedules, which both the District and CARB have substantially met. EPA considers these schedules to provide sufficient time to achieve by 2014 the few remaining reductions needed to attain by the attainment date of April 5, 2015. *See* Tables F-3 and F-6 above. We, therefore, conclude that the third factor is satisfied.

iv. Summary of Finding on Enforceable Commitments in the SJV 2008 PM_{2.5} SIP

EPA believes circumstances warrant the consideration of enforceable commitments as part of the attainment demonstration in the 2008 SJV PM_{2.5} SIP. As stated above, measures already adopted by the District and State and approved or proposed for approval pursuant to CAA section 110(k) or waived pursuant to CAA section 209 by EPA provide the great majority

³⁵ *See*, for example, SJVAPCD; U.S. EPA; USDA, NRCS; and CARB; Statement of Principles Regarding the Approach to State Implementation Plan Creditability of Agricultural Equipment Replacement Incentive Programs Implemented by the USDA Natural Resource Conservation Service and the San Joaquin Valley Air Pollution Control District," December 2010.

of emissions reductions needed to demonstrate attainment of the 1997 PM_{2.5} standards in the SJV by 2015. We have found that the reductions that remain as enforceable commitments represent a limited portion of the overall reductions needed for attainment. We have also found that the State and District are capable of fulfilling their remaining commitments and that the commitments are for a time period that is both reasonable and appropriate to assure that the remaining reductions are in place prior to the attainment date of April 5, 2015. As a result of our findings here, EPA is accepting enforceable commitments as part California's strategy to attain the 1997 PM_{2.5} NAAQS in the SJV.

v. Action on Enforceable Commitments to Reduce Emissions and Adopt Specific Measures

We are approving the SJVUAPCD's commitments to adopt and implement specific control measures on the schedule identified in Table 6-2 (as amended June 15, 2010) in the 2008 PM_{2.5} Plan, to the extent that these commitments have not yet been fulfilled and to achieve specific aggregate emissions reductions of direct PM_{2.5}, NO_x and SO_x by specific years as given in Table 6-3 of the 2008 PM_{2.5} Plan.

We are also approving CARB's commitments to propose certain defined measures, as given in Table B-1 in 2011 Progress Report and to achieve the total emissions reductions necessary to attain Federal standards through the implementation of control measures; the expenditure of local, State, or federal incentive funds; or through other enforceable measures." See CARB Resolution 07-28, Attachment B at pp. 3-6. We note that the updates and improvements to the projected baseline inventories as presented in CARB's 2011 Progress Report altered the calculation of the reductions needed for attainment of the 1997 PM_{2.5} standards in SJV by reducing the total reductions needed from control strategy measures to 9 tpd (for PM_{2.5}), 26.1 tpd (for NO_x), and 0.8 tpd (for SO₂). See Table F-9 above. We therefore interpret CARB's emissions reduction commitment, together with the adjustments to the 2014 baseline inventories provided in CARB's 2011 SIP revision and the District's commitments, as adjusting CARB's total emission reduction commitment such that the CARB is now obligated to achieve 2.3 tpd of PM_{2.5} reductions and 17.1 tpd of NO_x reductions by 2014 through enforceable control measures to provide for attainment of the 1997 PM_{2.5} NAAQS in SJV. See Table F-12 above.

We also note that we do not agree with CARB's position that "actual decreases occurring in any air basin for which emission reduction commitments have been made" or incentive programs may be counted as SIP credit toward CARB's enforceable commitment, unless the State provides a demonstration that such emission decreases are enforceable or otherwise meet EPA's criteria for SIP creditability.

G. Attainment Demonstrations

1. Requirement for Attainment Demonstrations

CAA sections 172(b) and (c) require states to submit plans that demonstrate attainment of the applicable standard as expeditiously as practicable but no later than the applicable attainment date. Under the PM_{2.5} implementation rule, this demonstration should consist of four parts:

- (1) technical analyses that locate, identify, and quantify sources of emissions that are contributing to violations of the PM_{2.5} NAAQS;
- (2) analyses of future year emissions reductions and air quality improvement resulting from already-adopted national and local programs, and from potential new local measures to meet the RACT, RACM, and RFP requirements in the area;
- (3) adopted emissions reduction measure with schedules for implementation; and
- (4) contingency measures required under section 172(c)(9) of the CAA.

See 72 FR 20586, 20605.

The requirements for parts 1 and 2 are described in the emissions inventory (II.A.), air quality modeling (II.B), and RACM/RACT (II.D) sections of this TSD. Requirements for parts 3 and 4 are described in the control strategy (II.F.) and contingency measures (II.I.) sections of this TSD, respectively. In this section, we evaluate how these parts taken together provide for attainment of the 1997 PM_{2.5} NAAQS in the San Joaquin Valley as expeditiously as practicable but no later than the attainment date required by the CAA.

2. Attainment Demonstration in the SJV 2008 PM_{2.5} Plan

The attainment demonstration in the 2008 PM_{2.5} Plan is in Section 9.1 “Attainment Outlook.” It is summarized in Table G-1 below.

Since adoption and submittal of the 2007 State Strategy and the 2008 PM_{2.5} Plan, both CARB and the District have adopted most of the measures that they committed to adopt in their plans, and majority have been approved, proposed for approval, or granted a CAA section 209 waiver by EPA. *See* Tables F-3 and F-6. In the 2011 Progress Report, CARB and the District have updated the emissions reductions expected from their adopted measures and resulting from changes to inventory and the economic recession. Table G-2 shows the impact of these updates on the attainment demonstration, and Table G-3 shows the effect of these updates and EPA’s proposed and final approvals on the level of commitments remaining in the attainment demonstration.

Table G-1 Summary of the SJV's PM_{2.5} the Attainment Demonstration as Submitted June 2008 (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO ₂
A	2005 baseline emissions level	86.0	575.4	26.4
B	2014 attainment target level	63.3	291.2	24.6
C	Total reductions needed from 2005 baseline levels to attain in 2014 (A – B)	22.7	284.2	1.8
D	Adjusted 2014 baseline emissions level	72.3	317.3	25.4
	Reductions from baseline measures and adjustments to baseline (A-D)	13.7	258.1	1.0
	Percent of reductions needed for attainment from baseline measures	60.4%	90.8%	56%
	Reductions needed from control strategy measures (B - D)	9.0	26.1	0.8
	Percent of reductions needed for attainment from control strategy measures	39.6%	9.2%	44%

Source: Table F-9.

Table G-2 Summary of the SJV PM_{2.5} Attainment Demonstration Updated April 2011 with Additional Adjustments (tons per average annual day in 2014)				
		PM _{2.5}	NO _x	SO ₂
A	2005 base year emissions level	86.0	575.4	26.4
B	2014 attainment target level	63.3	291.2	24.6
C	Total reductions needed from 2005 base year levels to attain in 2014 (A – B)	22.7	284.2	1.8
D	Unadjusted 2014 baseline emissions level	75.0	376.2	25.5
E	Adjustment to 2014 baseline emissions level	2.7	63.1	0.1
F	Uncreditable reductions from Rule 9510 in the 2014 baseline	-	4.2	-
G	Adjusted 2014 baseline emissions level (D–E+F)	72.3	317.3	25.4
	Reductions from baseline measures (A-G)	13.7	258.1	1.0
	Percent of reductions needed for attainment from baseline measures	60.4%	90.8%	56%
	Reductions needed from control strategy measures (G-C)	9.0	26.1	0.8
	Percent of reductions needed for attainment from control strategy measures	39.6%	9.2%	44%

Table G-3 Reductions Needed for Attainment Remaining as Commitments based on SIP-Creditable Measures (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO _x
A	Total reductions needed from baseline and control strategy measures to attain	22.7	284.2	1.8
B	Adjustments to baseline and reductions from baseline measures (Table F-9)	13.7	258.1	1.0
C	Total reductions from approved/proposed for approval measures (Tables F-4 and F-9)	6.0	13.2	3.6
D	Total reductions remaining as commitments (A-B-C) ¹	3.0	12.9	0.0
	Percent of total reductions needed remaining as commitments	13.2%	4.5%	0%

3. Proposed Actions on the Attainment Demonstration in the SJV 2008 PM_{2.5} Plan

In 2010, we proposed to disapprove the attainment demonstration in the SJV 2008 PM_{2.5} Plan based on our proposed disapproval of the air quality modeling and RACM/RACT demonstration and our proposal to deny the State's request to extend the attainment date for the SJV until April 5, 2015. We also proposed to disapprove the attainment demonstration because, at the time of the 2010 proposal, the State's and District's unfulfilled commitments represented 41 percent of the direct PM_{2.5} reductions, 28 percent of the NO_x reductions, and 44 percent of the SO₂ emissions reductions required for attainment. These percentages were well above the roughly 10 percent figure generally acceptable in order for EPA to approve an attainment demonstration that relies in part on enforceable commitments. *See* 75 FR 74518, 74536 and Section II.D. of the 2010 Proposal TSD.

In 2011, we proposed to approve the attainment demonstration in the Plan based on our proposed determination that the emissions inventory and air quality modeling provided an adequate technical basis for it, our proposed finding that the Plan provided for RACM/RACT, our proposed granting of the attainment date extension, and our proposal to allow the use of enforceable commitments. *See* 76 FR 41338, 41356 and 2011 Proposal TSD, section II.G.

4. Evaluation and Conclusions

In order to approve a SIP's attainment demonstration, EPA must make several findings and approve the State's requested attainment date.

First, we must find that the demonstration's technical bases—emissions inventories and air quality modeling—are adequate. As discussed above in sections II.A. and II.B., we are finding that the emissions inventories and the air quality modeling on which the SJV 2008 PM_{2.5} SIP's attainment demonstration is based meet applicable EPA regulations and guidance and are an acceptable basis for the demonstration.

Second, we must find that the SIP provides for expeditious attainment through the implementation of all RACM and RACT on sources of direct PM_{2.5} and each PM_{2.5} attainment plan precursor. As discussed above in section II.D., we are approving the RACM/RACT demonstration in the SJV PM_{2.5} SIP.

Third, EPA must find that the emissions reductions that are relied on for attainment are creditable. As discussed in section II.F., the 2008 PM_{2.5} SIP relies principally on adopted and approved/waived rules to achieve the emissions reductions needed to attain the 1997 PM_{2.5} standards in the SJV by April 5, 2015. The balance of the reductions is currently in the form of enforceable commitments that account for 13.2 percent of the direct PM_{2.5} and 4.5 percent of the NO_x emissions reductions needed from 2005 levels for attainment. *See* Table G-4.

EPA has previously accepted enforceable commitments in lieu of adopted control measures in attainment demonstrations when the circumstances warrant it and the commitments meet three criteria. As discussed in above in section II.F.4., we believe that circumstances here warrant the consideration of enforceable commitments and that the three criteria are met: 1) the commitments constitute a limited portion of the required emissions reductions, 2) both the State and the District have demonstrated their capability to meet their commitments, and 3) the commitment are for an appropriate timeframe. Based on these conclusions, we are allowing the State to rely on these limited enforceable commitments in its attainment demonstration.

Finally, for a PM_{2.5} nonattainment area that cannot attain within five years of its designation as nonattainment, EPA must grant an extension of the attainment date in order to approve the attainment demonstration for the area. As discussed above in section II.E., we find that a five-year extension of the attainment date is appropriate given the severity of the nonattainment problem in the SJV and availability and feasibility of control measure. We, therefore, are granting the State's request to extend the attainment date in the SJV to April 5, 2015.

For the foregoing reasons, we approve the attainment demonstration in the SJV 2008 PM_{2.5} SIP.

We received a number of public comments on our proposal to approve the attainment demonstration in the SJV 2008 PM_{2.5} SIP. We have considered these comments and determined that none adversely affect our approval. We summarize these comments and provide full responses to them in section III.G. of this TSD.

H. Reasonable Further Progress Demonstrations

1. Requirements for Reasonable Further Progress Demonstrations

Clean Air Act Section 172(c)(2) requires that plans for nonattainment areas shall provide for reasonable further progress (RFP). RFP is defined in section 171(1) as “such annual incremental reductions in emissions of the relevant air pollutant as are required by [Part D] or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable [NAAQS] by the applicable date.”

The PM_{2.5} implementation rule requires a state to submit a RFP plan at the same time as its attainment demonstration for any area for which the state requests an extension of the attainment date beyond 2010. The RFP plan must provide emissions reductions such that emissions in 2009 represent generally linear progress from the baseline year to the attainment year. Where a state requests an extension of the attainment deadline to 2014 or 2015, the state must additionally provide emissions reductions such that emissions in 2012 represent generally linear progress from the baseline year to the attainment year. *See* 40 CFR § 51.1009(c). 72 FR 20586, 20633.

The RFP plan must describe the control measures that provide for meeting the reasonable further progress milestones for the area, the timing of implementation of those measures, and the expected reductions in emissions of direct PM_{2.5} and all PM_{2.5} attainment plan precursors. *See* 40 CFR § 51.1009(c).

A state is also required to demonstrate in its RFP plan that in each applicable milestone year, emissions will be at a level consistent with generally linear progress in reducing emissions between the base year and the attainment year. *See* 40 CFR § 51.1009(d). A state may demonstrate this by showing that emissions for each milestone year are either 1) roughly equivalent to benchmark emission levels for direct PM_{2.5} emission and each PM_{2.5} attainment plan precursor addressed in the plan or 2) at levels included in an alternative scenario that is projected to result in a generally equivalent improvement in air quality by the milestone year as would be achieved under the first option. *See* 40 CFR § 51.1009(g) and 72 FR 20586, 20639.

The steps for determining the benchmark emissions levels are given in the PM_{2.5} implementation rule in 40 CFR § 51.1009(f):

(1) For direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy, the full implementation reduction is calculated by subtracting the full implementation inventory from the baseline year inventory. The full implementation inventory is the projected RFP emissions inventory for the year preceding the attainment date, representing a level of emissions that demonstrates attainment. The baseline year inventory is the emissions inventory for the year used as the base year for the attainment demonstration (*see* 40 CFR § 51.1000).

(2) For direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy, a benchmark emissions reduction is calculated by multiplying the full implementation reduction by the milestone date fraction. The milestone date fraction is the ratio of the number of years from the baseline year to the milestone inventory year divided by the number of years from the baseline year to the full implementation year.

(3) The benchmark emissions level in the milestone year is calculated for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor by subtracting the benchmark emissions reduction from the baseline year emission level. The benchmark RFP plan is defined as a plan that achieves benchmark emission levels for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy for the area.

In comparing inventories between baseline and future years for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor, the inventories must be derived from the same geographic area. The plan must include emissions estimates for all types of emitting sources and activities in the geographic area from which the emissions inventories for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the plan are derived. *See* 40 CFR § 51.1009(f)(5).

The equivalence of an alternative scenario to the corresponding benchmark plan must be determined by comparing the expected air quality changes of the two scenarios at the design value monitor location. This comparison should use the information developed for the attainment plan to assess the relationship between emissions reductions of the direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the attainment strategy and the ambient air quality improvement for the associated ambient species. *See* 40 CFR § 51.1009(h).

2. RFP Demonstration in the SJV 2008 PM_{2.5} Plan

The RFP demonstration is in Chapter 8 of the 2008 PM_{2.5} Plan and is updated and revised in Appendix C of 2011 Progress Report. The demonstration addresses direct PM_{2.5}, NO_x, and SO₂ and uses the 2005 annual average day inventory as the base year inventory and 2014 as the attainment year.

Table H-1 shows the calculation of the full implementation reductions, the first step in determining the RFP benchmarks under the PM_{2.5} implementation rule.

Table H-2 provides the benchmark calculations from the Plan. The State is requesting an extension of the attainment date until April 5, 2015 which means 2014 is the attainment year for the purposes of the RFP benchmark calculation. The 2014 attainment year is 9 years from the 2005 base year making the 2009 milestone date fraction 4/9 and the 2012 milestone date fraction 7/9.

Table H-1 Full Implementation Reductions (tons per average annual day)			
	Direct PM _{2.5}	NO _x	SO ₂
2005 base year inventory	86.0	575.4	26.4
2014 attainment target emissions level (full implementation inventory)	63.3	291.2	24.6
Full implementation reductions for attainment	22.7	284.2	1.8

Source: 2008 PM_{2.5} Plan, Table 8-1

Table H-2 Benchmark Calculations (tons per average annual day)				
		Direct PM _{2.5}	NO _x	SO ₂
A.	Full implementation reductions	22.7	284.2	1.8
B.	2009 milestone date fraction (4/9)	0.44	0.44	0.44
C.	2009 benchmark emissions reductions (A * B)	10.1	126.3	0.8
D.	2009 benchmark emissions level (2005 baseline inventory – C)	75.9	449.1	25.6
E.	2012 milestone date fraction (7/9)	0.78	0.78	0.78
F.	2012 benchmark emissions reductions (A * E)	17.7	221.0	1.3
G.	2012 benchmark emissions level (2005 baseline inventory – F)	68.3	354.4	25.1
H.	Annual reductions needed for linear progress ($\frac{1}{9}$ * A)	2.5	31.6	0.2
I.	Percent annual reductions needed for linear progress ($\frac{1}{9}$ * A/2005 baseline inventory)	2.9%	5.5%	0.8%

Source: 2008 PM_{2.5} Plan, Table 8-2

3. Proposed Actions on the RFP Demonstration in the SJV 2008 PM_{2.5} Plan

In our 2010 proposal, we proposed to disapprove the RFP demonstration in the SJV PM_{2.5} Plan based on our proposed disapproval of the air quality modeling analysis and attainment demonstration. Air quality modeling establishes the emissions levels needed for attainment. These levels are also needed to determine what constitutes generally linear progress towards attainment in an area. *See* 75 FR 74518, 74537 and 2010 Proposal TSD, Section II.H.

In our 2011 proposal, we proposed to approve the RFP demonstration in the PM_{2.5} Plan. We also proposed to find that the SJV had met its 2009 milestone. *See* 76 FR 41338, 41357 and 2011 Proposal TSD, section II.H.

4. Evaluation and Conclusions

Because California has requested an attainment date of April 5, 2015 for the SJV, the Plan has addressed RFP for both 2009 and 2012 as required by 40 CFR § 51.1009(c)(2).

The SJV 2008 PM_{2.5} Plan describes in Chapter 6 (tables 6-2 and 6-3) the non-baseline control measures that are relied on to meet the reasonable further progress milestones for the area, the timing of implementation of these measures, and the expected reductions in emissions of direct PM_{2.5} and the PM_{2.5} attainment plan precursors, NO_x and SO_x, as required by 40 CFR § 51.1009(c). The District updated this information in supplemental documentation it provided to EPA. *See* SJVAPCD, Table 3-1 “Adjusted PM_{2.5} Inventory,” Table 3-21 “Adjusted NO_x Inventory,” and Table 3-3 “Adjusted SO_x Inventory,” no date.

The RFP demonstration does not address VOC or ammonia controls or emissions reductions. Because EPA has determined that there is insufficient information to overcome the presumption in the PM_{2.5} implementation rule that VOC and ammonia are not PM_{2.5} attainment plan precursors for attainment of the 1997 PM_{2.5} standards in the SJV (*see* section II.C of this TSD), the Plan does not need to provide an RFP demonstration for either precursor. 40 CFR § 51.1009(f).

In comparing inventories between baseline and future years for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor, the inventories are derived from the same geographic area. The Plan includes emissions estimates for all sources and activities in the SJV from which the emissions inventories for direct PM_{2.5} emissions and each PM_{2.5} attainment plan precursor addressed in the Plan are derived as required by 40 CFR § 51.1009(f).

In preparing its RFP demonstration, the State followed the procedures in by 40 CFR § 51.1009(f) and correctly calculated the benchmark emissions levels.

Using data from the 2011 Progress Report, we have evaluated the Plan’s past and projected controlled emissions levels against the 2009 and 2012 benchmark emissions levels adjusted to remove currently uncreditable reductions. *See* Table H-3. As can be seen from this table, controlled emissions levels for direct PM_{2.5}, NO_x, and SO_x were below the benchmarks for 2009, demonstrating that the SJV met its RFP targets in that year. For 2012, the projected controlled emissions level for direct PM_{2.5} is only slightly above (by less than 5 percent) its benchmark and the projected controlled levels for NO_x and SO_x are substantially below their benchmarks. We find that, overall, these projected controlled emissions levels represent generally linear progress for 2012.

Based on our evaluation summarized above, we find that the SJV 2008 PM_{2.5} SIP provides for reasonable further progress as required by CAA section 172(c)(2) and 40 CFR § 51.1009. We also find that the SJV has met its 2009 RFP benchmarks.

We received a few comments on our proposed approval of the SJV 2008 PM_{2.5} SIP's RFP demonstration. We have considered these comments and determined that none adversely affect our approval. We summarize these comments and provide full responses to them in section III.G. of this TSD.

Table H-3 RFP Demonstration Using Updated Control Measures and Baseline Data (tons per annual average day)			
	Direct PM _{2.5}	NO _x	SO ₂
2009			
Benchmark emissions level	76	449	26
Projected controlled emissions level	73	381	23
Currently uncreditable reductions from Rules 9410, 9510, and 4320 (Table H-4)	0	5.5	0
Corrections to estimated reductions from Rule 4692 (Table H-4)	0	0	0
Revised projected controlled emissions level	73	387	23
Emissions below benchmark emissions level	-3	-62	-3
Percent above/below benchmark emissions level	-4%	-14%	-12%
2012			
Benchmark emissions level	68	354	25
Projected controlled emissions level	70	328	20
Currently uncreditable reductions from Rules 9410, 9510, and 4320 (Table H-4)	0	8.2	0
Corrections to estimated reductions from Rule 4692 (Table H-4)	0.9	0	0
Revised projected controlled emissions level	71	336	20
Emissions above/below benchmark emissions level	+3	-18	-5
Percent below benchmark emissions level	+4%	-5%	-20%

Table H-4 Adjustments to Control Measures Reductions for the RFP Demonstration (tons per annual average day)				
	2009		2012	
	NO _x	Direct PM _{2.5}	NO _x	Direct PM _{2.5}
Rule 9410 – Employer Based Trip Reduction Program	0	0	0.3	0
Rule 9510 – Indirect Source Review	5.5	0	6.3	0
Rule 4320 – AERO for Boilers	0	0	1.6	0
Rule 4692 – Commercial Charbroiling	0	0	0	0.9
Total Adjustment	5.5	0	8.2	0.9

Estimated Effect of Base Year Inventory Changes on the SJV 2008 PM_{2.5} SIP's RFP Demonstrations

As discussed in section II.A. of this TSD, CARB has updated the inventories for several mobile source categories including off-road equipment and heavy duty diesel trucks and estimates that these updates reduce the 2005 base year inventory by approximately 6 percent for NO_x and 5 percent for PM_{2.5}. CARB Progress Report supplement, Attachment 1. The State, however, did not revise the RFP demonstration in the SJV 2008 PM_{2.5} Plan to incorporate these adjustments.

As shown in Tables H-5 and H-6 below, we have evaluated the effect on the RFP demonstration of making these minor adjustments to the 2005 base year inventory. As can be seen from these tables, the Plan still provides for RFP with these adjustments.

Table H-5 Estimated Effect of Changes to the 2005 Base Year Inventory on the RFP Demonstration – Milestone Calculation (tons per average annual day)				
		Direct PM _{2.5}	NO _x	SO ₂
A.	Base year inventory	86.0	575.4	26.4
B.	Adjusted base year inventory assuming 4.7% reduction in PM _{2.5} and 6.1% reduction in NO _x (no change to SO ₂)	82.0	540.3	26.4
C.	Attainment level	63.3	291.2	24.6
D.	Adjusted full implementation reductions (B-D)	18.7	249.1	1.8
E.	2009 milestone date fraction (4/9)	0.44	0.44	0.44
F.	Adjusted 2009 benchmark emissions reductions (D * E)	8.2	109.6	0.8
G.	Adjusted 2009 benchmark emissions level (B- F)	73.7	430.7	25.6
H.	2012 milestone date fraction (7/9)	0.78	0.78	0.78
I.	Adjusted 2012 benchmark emissions reductions (D * H)	14.6	194.3	1.3
J.	Adjusted 2012 benchmark emissions level (2005 baseline inventory – F)	67.4	346.0	25.1
K.	Annual reductions needed for linear progress (¹ / ₉ *D)	2.1	27.7	0.2
L.	Percent annual reductions needed for linear progress (¹ / ₉ *D / 2005 baseline inventory)	2.5%	5.1%	0.8%

Table H-6 Estimated Effect of Changes to the 2005 Base Year Inventory on RFP Demonstration (tons per annual average day)			
	Direct PM _{2.5}	NO _x	SO ₂
2009			
Benchmark emissions level	73.7	430.7	26
Revised projected controlled emissions level (Table H-3)	73	387	23
Emissions below benchmark emissions level	-0.7	-43.7	-3
Percent below/above benchmark emissions level	-1.0%	-10.1%	-12%
2012			
Benchmark emissions level	67.4	346.0	25
Revised projected controlled emissions level (Table H-3)	70.9	336	20
Emissions below/above benchmark emissions level	3.5	-10	-5
Percent below/above benchmark emissions level	5.1%	-2.9%	-20%

Earthjustice Petition on the PM_{2.5} Implementation Rule

In June 2007, a petition to the EPA Administrator was filed on behalf of several public health and environmental groups requesting reconsideration of several provisions in the PM_{2.5} implementation rule. *See* Earthjustice, “Petition for Reconsideration in the Matter of the Final Clean Air Fine Particulate Implementation Rule,” June 25, 2007. Among these provisions is allowing states to use emissions reductions from outside of the nonattainment area to demonstration RFP (out-of-area RFP) as discussed in 72 FR 20586, 20636. On May 13, 2010, EPA granted the petition with respect to this issue. *See* Letter, Gina McCarthy, Assistant Administrator for Air and Radiation, EPA, to David Baron and Paul Cort, Earthjustice, May 13, 2010. The updated SJV 2008 PM_{2.5} plan does not rely on out-of-area emissions reductions to demonstrate RFP.

I. Contingency Measures

1. Requirements for Contingency Measures

Under CAA section 172(c)(9), all PM_{2.5} attainment plans must include contingency measures to be implemented if an area fails to meet RFP (RFP contingency measures) and contingency measures to be implemented if an area fails to attain the PM_{2.5} NAAQS by the applicable attainment date (attainment contingency measures). *See* 40 CFR § 51.1012. The purpose of contingency measures is to continue progress in reducing emissions while the SIP is being revised to meet the missed RFP milestone or correct continuing nonattainment.

The principle requirements for contingency measures are:

- Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date.
- The SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without further action by the state or by EPA. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the state of a failure.
- The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP.
- The measures should provide for emissions reductions equivalent to approximately one year of reductions needed for RFP calculated as the overall level of reductions needed to demonstrate attainment divided by the number of years from the base year to the attainment year.

See 72 FR 20586, 20643.

The April 16, 1992 General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990 (57 FR 13498, 13512) provides the following guidance on contingency measures which continues to be applicable:

States must show that their contingency measures can be implemented without further action on their part and with no additional rulemaking actions such as public hearings or legislative review. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the State of its failure.

Contingency measures can include both Federal, state and local measures already scheduled for implementation or already implemented. The CAA requires contingency measures that provide for additional emissions reductions that are not relied on for RFP or attainment and are not included in these demonstrations. In other words, contingency measures are intended to achieve reductions over and beyond those relied on in the RFP and attainment demonstrations. Nothing in the CAA precludes a state from implementing such measures before they are triggered. EPA has approved numerous SIPs under this interpretation. *See*, for example, 62 FR 15844 (April 3, 1997) (direct final rule approving Indiana ozone SIP revision);

62 FR 66279 (December 18, 1997) (final rule approving Illinois ozone SIP revision); 66 FR 30811 (June 8, 2001) (direct final rule approving Rhode Island ozone SIP revision); 66 FR 586 (January 3, 2001) (final rule approving District of Columbia, Maryland, and Virginia ozone SIP revisions); and 66 FR 634 (January 3, 2001) (final rule approving Connecticut ozone SIP revision). A court has upheld this interpretation. *See LEAN v. EPA*, 382 F.3d 575, 5th Circuit, 2004.

2. Contingency Measures in the SJV 2008 PM_{2.5} Plan and 2011 Progress Report

Contingency measures in the 2008 PM_{2.5} SIP are composed of several types: a new commitment to an action by the SJVAPCD, surplus reductions in the RFP demonstration, post-2014 emissions reductions, a contingency provision in an adopted rule, reductions from incentive funds, and reductions of specifically-identified implemented rules that are not otherwise relied on in the attainment and RFP demonstrations.

Contingency measures are discussed in Section 9.2.2. of the Plan, on page 29 of the CARB Staff Report, and Appendix A of the CARB Resolution 08-28 adopting the Plan. Updated information on both the RFP and attainment contingency measures for the SJV 2008 PM_{2.5} Plan is provided in the 2011 Progress Report and Supplement. This information includes revisions to the RFP demonstration that shows excess reductions and updated estimates of the reductions in 2015 from the State's mobile source control program. *See* 2011 Progress Report, Appendix A, p. 2, Appendix C, Table C-1, and CARB Progress Report supplement, Attachment 2.

CARB also discusses the contingency measure provision in Appendix D of the 2007 State Strategy; however, this discussion addresses the contingency measure provisions for California's 8-hour ozone plans and not the PM_{2.5} plans.

a. New Commitment

As a contingency measure, the District proposed to request that CARB accelerate the adoption and/or implementation of any remaining CARB control measures that have not yet been adopted or fully implemented, to the extent feasible. This request would be made through a formal District Governing Board resolution adopted at a regularly-scheduled Governing Board hearing to be held within two months after a finding by EPA of a failure to meet an RFP milestone. Potential emissions reductions from this proposed contingency measure are not quantified. *See* 2008 PM_{2.5} Plan, p. 9-7.

b. General Surplus Reductions in the RFP Demonstration and Post-2014

Surplus Reductions in the RFP Demonstration – In the June 2008 version of the Plan, the method used to calculate emissions reductions needed to meet RFP benchmarks withheld a certain percentage of those reductions for contingency purposes: 1 percent of the baseline PM_{2.5} inventory and 3 percent of the baseline NO_x inventory. These percentages equated to roughly 1 tpd direct PM_{2.5} and 17 tpd NO_x being reserved for contingency. No reserve was included for SO_x because SO_x emissions levels were projected to be below the applicable benchmarks. *See* 2008 PM_{2.5} Plan, p. 8-4.

The 2011 Progress Report updates the RFP demonstrations in the 2008 PM_{2.5} Plan. *See* 2011 Progress Report, Table C-1. The updated demonstration does not include a contingency measure reserve but rather shows that controlled emissions levels of NO_x and SO_x are or will be

below the required RFP benchmarks. SO_x reductions that are in excess of those needed to meet RFP and contingency are reserved for PM_{2.5} contingency measures at an interpollutant trading ratio of 1 tpd SO_x to 1 tpd direct PM_{2.5}. *See* 2011 Progress Report, Appendix A, p. 2 and (for the trading ratio), SJV PM_{2.5} Progress Report, Table 2-2.

Post-2014 Emissions Reductions – The 2008 PM_{2.5} Plan relies on the incremental emissions reductions that will occur in 2015 from CARB’s mobile source program to provide for contingency measures for failure to attain. *See* p. 9-9. The Plan does not provide an estimate of that these reductions. CARB initially estimated the NO_x reductions at 21 tpd in 2015. *See* CARB Staff Report, p. 29.

CARB updated the estimated incremental emissions reductions that will occur in 2015 from its mobile source program including the reductions expected from its In-use Truck and Bus and In-Use Off-Road Engine Rules. *See* CARB Progress Report supplement, Attachment 2. The updated 2015 reductions are: 3 tpd SO₂ and 21 tpd NO_x.

c. Adopted or Scheduled for Adoption Rules/Incentive Funds

Rule 3170 – This rule, Federally Mandated Ozone Nonattainment Fee, was adopted by the District in 2002 to meet the requirements of CAA section 185.³⁶ This CAA section requires each major stationary source of VOC or NO_x located in the a severe or extreme ozone nonattainment that fails to attain the ozone standard by the area’s applicable attainment date to pay a fee to the state in each calendar year following the attainment year for all emissions above a baseline amount until the area attains the ozone standard.

The CAA does not specify how states may spend or allocate the fees collected under a section 185 fee program; therefore, states have discretion on how to use them. EPA encourages states to use the fees to provide incentives for additional ozone precursor emissions reductions from stationary and/or mobile sources or for other purposes aimed at reducing ambient ozone concentrations in the affected area.³⁷ In the 2008 PM_{2.5} Plan, the District indicated that it would use any funds collected under Rule 3170 (should the area fail to timely attain the 1-hour ozone standard and the rule be triggered) to implement other pollution control programs. *See* 2008 PM_{2.5} Plan, p. 9-8.

The District has recently revised its CAA section 185 program to create an equivalent fee program as allowed under EPA’s policy. *See* fn. 37. The District’s section 185 equivalency program includes not only revisions to Rule 3170 but also a vehicle registration surcharge of \$12. The District expects to begin collecting vehicle registration fees in late 2011 and Rule 3170 fees in 2012. *See* SJVAPCD, Final Draft Staff Report Draft Amendments to Rule 3170 (Federally Mandated Ozone Nonattainment Fee), April 21, 2011. No estimate of emissions reductions expected from the section 185 equivalency program is given.

³⁶ EPA approved Rule 3170 into the California SIP under CAA section 110(k) on January 13, 2010. At the same time, we disapproved the rule under CAA section 185 as failing to fully meet the requirements of that CAA section. 75 FR 1716.

³⁷ For more information on requirements of CAA section 185, *see Memorandum*, Stephen D. Page, Director, Office of Air Quality Planning and Standard, EPA to Regional Air Division Directors, Regions I-X, “Guidance on Developing Fee Programs Required by Clean Air Act Section 185 for the 1-hour Ozone NAAQS,” January 5, 2010.

Rule 4307 – On October 16, 2008, the SJVAPCD adopted revisions to Rule 4307–Boilers, Steam Generators, and Process Heaters (2 to 5 MMBTU). These revisions lowered NO_x limits, added SO₂ and PM₁₀ limits, and removed certain exemptions. While the District committed to adopt revisions to Rule 4307 as part of the control strategy in the 2008 PM_{2.5} Plan’s control strategy, it had not included emissions reductions from these revisions in either the original RFP or attainment demonstration. Because of this, the reductions could be considered excess to these demonstrations.

Rule 4901 – On October 16, 2008, the SJVAPCD adopted revisions to its wood burning rule, Rule 4901–Wood Burning Fireplace and Wood Burning Heaters, to incorporate a contingency provision in section 5.6.5. This provision states that:

On or after sixty days following the effective date of EPA final rulemaking that the San Joaquin Valley Air Basin has failed to attain the 1997 PM_{2.5} National Ambient Air Quality Standards by the applicable deadline, the [air pollution control officer] shall notify the public of an Episodic Curtailment for a geographic region whenever a PM_{2.5} concentration of 20 µg/m³ or greater or a PM₁₀ concentration of 135 µg/m³ is predicted for the geographic region.

This provision lowers the trigger for calling an episodic curtailment from the existing 30 µg/m³. During an episodic curtailment, the operation of wood burning fireplaces, wood burning heater, or outdoor wood burning device (except when it is the sole source of heat) is prohibited. *See* Rule 4901, section 5.6.1. In its supporting documentations for this rule, the District did not quantify the emissions reductions expected should this contingency provision be triggered.

Rule 4702 – The District is currently anticipating adoption of revisions to Rule 4702–Internal Combustion (I/C) Engines–Phase 2, in August, 2011. Proposed revisions to this rule include lowering the applicability threshold of the rule to engines 25 hp and greater (from 50 hp) and lowering NO_x, VOC, and carbon monoxide limits for all spark-ignition I/C engines that are used in non-agricultural operations and making these revisions effective January 1, 2014. *See* SJVAPCD, Draft Staff Report For Draft Amendments To Rule 4702 (Internal Combustion Engines–Phase 2), September 9, 2010. While the District committed to adopt revisions to Rule 4702 as part of the control strategy in the 2008 PM_{2.5} Plan’s control strategy, it did not included emissions reductions from these revisions in either the original RFP or attainment demonstration. Because of this, the reductions could be considered excess to these demonstrations.

Incentive Funds – The District has received and expects to continue to receive significant funding for its incentive grant programs from sources that include the State’s Carl Moyer Program, Proposition IB Goods Movement Emission Reduction Program, vehicle registration surcharges, its Indirect Source Review Rule (Rule 9510), and the federal Diesel Emissions Reduction Act. Through its incentive programs, the District has funded and continues to fund numerous projects that reduce emissions in the Valley. *See* 2008 PM_{2.5} Plan, Section 6.5 and SJV PM_{2.5} Progress Report, section 2-3. For various reasons, mainly related to their SIP creditability, the emissions reductions generated from these incentive-funded projects are not included in either the RFP or attainment demonstration in the Plan.

In April 2007, the District’s Governing Board adopted a resolution committing to implement various procedural, record keeping, and reporting requirements to ensure that the all incentive-based reductions achieved by the District meet EPA requirements and guidance for SIP

credibility.³⁸ At the time the Plan was submitted in 2008, the District expected these requirements would be in place in time for the 2009 and 2012 RFP milestone years so that the emissions reductions from its various incentive programs could be used to meet the contingency measure requirement and for other SIP-related purposes.

The District currently estimates that there are \$112 million of incentive funds available to invest in the SJV for the 2010-2011 fiscal year. *See* SJV PM_{2.5} Progress Report, p. 2-4. This is in addition to over \$301 million received from 1998 until 2010. *See* SJV PM_{2.5} Progress Report, Table 2-5. The progress report does not include an estimate of the emissions reductions achieved or anticipated from the use of these funds.³⁹

3. Proposed Actions on the Contingency Measures in the SJV 008 PM_{2.5} SIP

In 2010 and 2011, we proposed to disapprove the RFP and attainment contingency measures in the 2008 PM_{2.5} Plan. We found that, although the Plan included suggestions for several potentially approvable contingency measures as well as several measures that did not meet the CAA's minimum requirements for contingency measures (e.g., no additional rulemaking, surplus to attainment and RFP needs), it did not provide sufficient information to determine if the emissions reductions from some of the approvable measures are SIP creditable or to quantify the expected emissions reductions. We, therefore, were unable to determine if the Plan's contingency measure provisions provided reductions roughly equivalent to one year's worth of RFP. *See* 75 FR 74518, 74539 and 76 FR 41338, 41359 and Section II.J. of both the 2010 and 2011 Proposal TSDs.

4. Evaluation and Conclusions

Under the PM_{2.5} implementation rule, a state must submit contingency measures that meet the requirements of CAA section 172(c)(9) and provide for the equivalent of roughly one year's worth of RFP. One year's worth of RFP is determined by dividing the emissions reductions from base year levels that are needed for attainment by the number of years between the base year (2005) and the attainment year (2014). 72 FR 20586, 20643. We show this calculation for SJV 2008 PM_{2.5} Plan in Table I-1 below.

We did not evaluate the provisions in the 2008 PM_{2.5} SIP that address contingency measures for failure to meet the 2009 RFP benchmarks. Information available to EPA and the public shows that SJV met its 2009 benchmarks for direct PM_{2.5}, NO_x, and SO_x. *See* 2011 Progress Report, Table C-1 and section II.H. of this TSD. As a result, contingency measures for failure to meet the 2009 RFP benchmark no longer have any meaning or effect under the CAA and therefore do not require any review or action by EPA. In addition, as noted above, the purpose of RFP contingency measures is to provide continued progress while the SIP is being revised to meet a missed RFP milestone. Failure to meet the 2009 benchmark would have required California to revise the SJV PM_{2.5} Plan to assure that the next milestone was met and that the Plan still provided for attainment. California has, in fact, prepared and submitted a

³⁸ SJVUAPCD Governing Board Resolution 07-04-11B, "In the Matter of: Adopting Commitments to Enhance SIP Creditability of Incentive-Based Emissions Reductions," April 30, 2007.

³⁹ In the 2008 PM_{2.5} Plan, the District estimated that the \$90 million per year of incentive funds then available to the SJV could provide 3.6 tpd of NO_x emissions each year, accumulating year to year (that is, after five years, for example, the cumulative reduction would be 18 tpd). *See* 2008 PM_{2.5} Plan, p. 9-9.

revision to the SJV PM_{2.5} SIP that shows that the SIP continues to provide for RFP in 2012 and for attainment by April 5, 2015.

Table I-1 Reductions Needed from Contingency Measures (tons per average annual day)				
		Direct PM _{2.5}	NO _x	SO _x
A	2005 baseline	86.0	575.4	26.4
B	2014 attainment level	63.3	291.2	24.6
C	Emissions reductions needed for attainment (A-B)	22.7	284.2	1.8
D	One year's RFP (C/9)	2.5	31.6	0.2
E	One year's RFP as percent of 2005 baseline	2.9%	5.5%	0.8%

a. New Commitment

CARB's measures are primarily aimed at reducing emissions from mobile sources. Accelerating their implementation to correct shortfalls in RFP and attainment would be appropriate given the contribution of mobile sources to PM_{2.5} standard exceedances in the SJV and the importance of mobile source measures to reducing and eliminating those exceedances. However, the process outlined in the 2008 PM_{2.5} Plan would require multiple steps to implement including the adopting of a resolution by the SJVUAPCD's governing board and rulemaking by CARB. Such a process would likely take more than a few months to complete.

Under CAA section 172(c)(9) and EPA's long-standing policies interpreting this section, contingency measures must require minimal additional rulemaking by the state and take effect within a few months of a failure to meet an RFP target or to attain. The District's proposed commitment to request accelerated implementation of CARB's measures meets neither of these requirements and thus does not qualify as a contingency measures under the CAA.

b. General Surplus Reductions in the RFP Demonstration and Post-2014

Surplus Reductions in the RFP Demonstration - As shown in Table I-2 below, emissions levels of NO_x and SO_x will be below the required RFP benchmarks in 2012. These surplus reductions are available use as NO_x and SO_x contingency measures for the 2012 RFP milestone. The 2011 Progress Report reserves the SO_x reductions that are in excess of those needed to meet RFP and contingency as PM_{2.5} contingency measures, using an interpollutant trading ratio of 1 tpd SO_x to 1 tpd direct PM_{2.5} to show equivalency. See 2011 Progress Report, Appendix A, p. 2. We do not, however, agree at this time with the use of an interpollutant trading ratio of 1:1 SO_x to direct

PM_{2.5} as the District has not provided an adequate technical justification for this ratio. *See* section II.B.4 above.

Post-2014 Emissions Reductions - Additional emissions reductions resulting from the implementation of adopted mobile source emission standards through fleet turnover in the 2015 and later may be used to meet the contingency measure requirement for failure to attain. CARB provides estimates for reductions in 2015 from its mobile source control program of 21 tpd NO_x, and 3 tpd SO₂. *See* CARB Progress Report supplement, Attachment 2.

Table I-2 Excess Reduction in Updated 2012 RFP Demonstrations Available for Use As Contingency Measures (tons per annual average day)			
	Direct PM _{2.5}	NO _x	SO _x
Benchmark emissions level	68	354	25
Revised projected controlled emissions level (Table H-3)	70.9	336	20
Emissions above/below benchmark emissions level	2.9	-18.0	-5
Excess SO _x proposed to substitute for PM _{2.5}	4.8		
1-Year's worth of RFP	2.5	31.6	0.2

c. Adopted or Scheduled for Adoption Rules

Rule 3170 – The District expects to begin to collect fees under its CAA section 185 program in late 2011. It is the District's intent to use the collected fees in its incentives grant program. *See* SJVUAPCD Governing Board Resolution, No. 10-10-14, October 21, 2010, p. 5. We address the use of incentive funds as contingency measures below.

Rule 4307 – Reductions from Rule 4307 are now included in the updated RFP and attainment demonstration contained in the 2011 Progress Report; therefore, reductions from this rule may no longer be used for contingency measures purposes.⁴⁰

Rule 4702 – The District has adopted revisions to Rule 4702 but the revised Rule has not been submitted to EPA or approved by EPA. Because this rule is not currently approved by EPA, it cannot be used for contingency measures purposes.

⁴⁰ Reductions from the Rule, however, can be used for contingency measures purposes to the extent that they contribute to creating excess reductions in the RFP demonstration.

Rule 4901 – We find that the contingency provisions in section 5.6.6 of Rule 4901 fully meet CAA requirements for contingency measures. The provision can be implemented with no additional rulemaking on the part of the District and must be implemented within 60 days of an EPA finding that the area has failed to attain the PM_{2.5} standards. We approved the October 2008 revision of Rule 4901, including the contingency provision, into the California SIP on November 10, 2009, 74 FR 57907.

Incentive Funds - As noted previously, the District has several incentive grant programs which use funds collected from a number of sources (including the District's CAA section 185 program). These grant programs have the potential to generate considerable emissions reductions. While neither the CAA nor EPA policy bar the use of emissions reductions from incentive programs to meet all or part of an area's contingency measure obligation, the incentive programs must assure that the reductions are surplus, quantifiable, enforceable, and permanent in accordance with EPA's guidance. See "Improving Air Quality with Economic Incentive Programs," EPA-452/R-01-001 (January 2001).

The 2008 PM_{2.5} Plan does not identify the incentive grant programs expected to generate the emissions reductions nor the quantity of these emissions reductions that the District intended to use to meet the contingency measure requirement. Therefore, we are unable to determine if they are SIP creditable or sufficient to provide in combination with other measures the roughly one-year's worth of RFP needed. For these reasons, this measure does not currently meet the CAA requirements for contingency measures.

d. Conclusion

Table I-3 provides a summary of the contingency measures in the SJV PM_{2.5} Plan.

The 2008 PM_{2.5} Plan includes suggestions for several potentially approvable contingency measures as well as several measures that do not meet the CAA's minimum requirements (e.g., no additional rulemaking, quick implementation). For many of the potential approvable contingency measures, the Plan neither provides sufficient information for us to determine if the emissions reductions are SIP creditable (e.g., those from incentive grant programs) nor quantifies the expected emissions reductions from them.

The 2011 Progress Report, however, does show that there are surplus reductions in the RFP demonstration for 2012. Appendix C, Table C-1. As shown on Table I-4, these surplus reductions do not provide emissions reductions equivalent to approximately one-year's worth of RFP when considered on a per-pollutant basis. EPA finds that these surplus reductions are insufficient to meet the CAA's requirements for RFP contingency measures.⁴¹

As also shown on Tables I-3 and I-4, the continuing implementation of the State's mobile source program in combination with the District's contingency measure in Rule 4901, if triggered, will reduce emissions substantially in 2015 (the year after the attainment year of

⁴¹ In the 2011 Progress Report, the State asserts that these reductions are equal to at least one-year's worth of RFP when considered on a PM_{2.5} equivalency basis; however, to make this showing, the State relies in part on an interpollutant trading ratio of 1 ton of SO_x reductions to 1 ton of PM_{2.5} reductions. As discussed in section II.B.4. of this TSD, there is insufficient technical support for this ratio and EPA is not allowing its use as part of the 2008 PM_{2.5} Plan. EPA may consider additional technical information submitted by the State to support an appropriate trading ratio and will provide an opportunity for public comment on such new information before allowing its use to meet a CAA requirement.

2014). However, these reductions do not provide emissions reductions equivalent to one year's worth of RFP when considered on a per-pollutant basis. EPA finds that these surplus reductions are insufficient to meet the CAA's requirements for attainment contingency measures.

Based on the above evaluation, EPA disapproves the RFP and attainment contingency measures in the SJV 2008 PM_{2.5} SIP pursuant to CAA section 172(c)(9) and 40 CFR § 51.1012.

Because we are approving the RFP and attainment demonstrations and the motor vehicle emission budgets, we are issuing a protective finding under 40 CFR § 93.120(a)(3) for the disapproval of the contingency measures. Without a protective finding, the disapproval would result in a conformity freeze under which only projects in the first four years of the most recent conforming Regional Transportation Plan and Transportation Improvement Programs can proceed. During a freeze, no new RTPs, TIPs or RTP/TIP amendments can be found to conform. *See* 40 CFR § 93.120(a)(2). Under a protective finding, however, the disapproval of the contingency measures does not result in a transportation conformity freeze in the San Joaquin PM_{2.5} nonattainment area.

We received a few comments on our proposed disapproval of the SJV 2008 PM_{2.5} SIP's contingency measures. We have considered these comments and determined that none change our determination that the contingency measures provisions are not currently approvable. We summarize these comments and provide full responses to them in section III.I. of this TSD.

Table I-3 Summary of Approvability of Contingency Measures from the SJV 2008 PM_{2.5} Plan							
Measure	RFP or Attainment Contingency Measure?	Approvable as a Contingency Measure?	Comment	Tons per Average Annual Day			
				Year	Direct PM _{2.5}	NO _x	SO _x
Request CARB to expedite implementation of mobile source controls	Both	No	Requires additional rulemaking, no short term reductions		N/A	N/A	N/A
Ozone Nonattainment Area Fee	2012 RFP milestone/ Attainment	No	Reductions are not SIP creditable (<i>see</i> Incentive funds—currently not SIP creditable)		Not quantified		
Incentives Funds – currently SIP creditable	Both	Yes			Not quantified		
Incentive Funds – currently not SIP creditable	Both	No	Reductions are not SIP creditable		Not quantified		
Excess Reductions in RFP Demonstration	RFP	Yes		2012	0	19.7	5
“New” Post Attainment Year Reductions	Attainment	Yes		2015	0.0	21	3
Revisions to Rule 4307	2012 RFP milestone/ Attainment	No	Reductions assumed in RFP and attainment demonstrations	2012	N/A	N/A	N/A
				2015	N/A	N/A	N/A
Revisions to Rule 4702	Attainment	No	Rule not adopted	2015	–	—	–
Contingency provision in Rule 4901	Attainment	Yes		2015	1.6 ¹	Not quantified	

¹ Phone conversation, Jessi Fierro, SJVAPCD, and Frances Wicher, EPA, August 26, 2010, value is average annual day.

Table I-4 Summary of Reductions from Contingency Measures (tons per average annual day)			
	Direct PM _{2.5}	NO _x	SO _x
2012 RFP contingency reductions	(-2.9)	18	5
Attainment contingency reductions	1.6	21	3
1-year's worth of RFP	2.5	31.6	0.2

J. Adequacy of the Motor Vehicle Emissions Budgets in the SJV 2008 PM_{2.5} SIP

1. Requirements for Motor Vehicle Emissions Budgets

CAA section 176(c) requires Federal actions in nonattainment and maintenance areas to conform to the SIP's goals of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of the standards. Conformity to the SIP's goals means that such actions will not: (1) cause or contribute to violations of a NAAQS, (2) worsen the severity of an existing violation, or (3) delay timely attainment of any NAAQS or any interim milestone.

Actions involving Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) funding or approval are subject to the EPA's transportation conformity rule, codified at 40 CFR part 93, subpart A. Under this rule, metropolitan planning organizations (MPOs) in nonattainment and maintenance areas coordinate with state and local air quality and transportation agencies, EPA, FHWA, and FTA to demonstrate that an area's regional transportation plans (RTP) and transportation improvement programs (TIP) conform to the applicable SIP. This demonstration is typically done by showing that estimated emissions from existing and planned highway and transit systems are less than or equal to the motor vehicle emissions budgets (budgets) contained in all control strategy SIPs. An attainment, maintenance, or RFP SIP should include budgets for the attainment year, each required RFP year or last year of the maintenance plan, as appropriate. Budgets are generally established for specific years and specific pollutants or precursors.

PM_{2.5} attainment and RFP plans should identify budgets for direct PM_{2.5} and PM_{2.5} attainment plan precursors. All direct PM_{2.5} SIP budgets should include direct PM_{2.5} motor vehicle emissions from tailpipe, brake wear, and tire wear. A state must also consider whether re-entrained paved and unpaved road dust or highway and transit construction dust are significant contributors and should be included in the direct PM_{2.5} budget. *See* 40 CFR § 93.102(b) and § 93.122(f) and the conformity rule preamble at 69 FR 40004, 40031–40036 (July 1, 2004).

An MPO may use budgets in a submitted but not-yet approved SIP only if EPA has first determined that the budgets are adequate. To be found adequate and to be eventually approved, the submittal must meet the conformity adequacy requirements of 40 CFR § 93.118(e)(4) and be approvable under all pertinent SIP requirements. In addition, the budgets must reflect all of the motor vehicle control measures contained in the attainment and RFP demonstrations. *See* 40 CFR § 93.118(e)(4)(v).

2. Motor Vehicle Emissions Budgets in the SJV 2008 PM_{2.5} SIP

a. MVEB Submitted in SJV 2008 PM_{2.5} Plan (submitted June 2008)

The SJV 2008 PM_{2.5} Plan included budgets for direct PM_{2.5} and NO_x for the attainment year of 2014 and the RFP years of 2009 and 2012. *See* 2008 PM_{2.5} Plan, Section 7.2.2 and Appendix C. The direct PM_{2.5} budgets included tailpipe, brake wear, and tire wear emissions but did not include paved road, unpaved road, and road construction dust because these were determined to be insignificant contributors to PM_{2.5} levels in the Valley. 2008 PM_{2.5} Plan, p. 7-5. No budgets for SO_x were included because on-road emissions of SO_x were also considered insignificant. *Id.* No budgets were included for either VOC or ammonia because neither was considered a PM_{2.5} attainment plan precursor in the 2008 PM_{2.5} Plan. *See* section II.C of this TSD.

b. Updated MVEB Submitted in 2011

On May 18, 2011, CARB submitted updated MVEB for the San Joaquin Valley and their documentation in Appendices D and A, respectively, of the 2011 Progress Report. On July 29, 2011, CARB submitted revisions to these updated MVEB in Appendix A-2 of the 2011 Ozone SIP Revisions.⁴² The revised updated MVEB are for direct PM_{2.5} and NO_x for the RFP year of 2012 and the attainment year of 2014. *See* Table J-1 below. No budgets were included for the RFP year of 2009 because it is no longer applicable as a conformity analysis year. Additional information associated with the motor vehicle emission budget calculations were provided in Appendix C of 2011 Ozone SIP Revisions and supplement.

The submittals also include a trading mechanism for transportation conformity analyses that would allow future decreases in NO_x emissions from on-road mobile sources to offset any on-road increases in PM_{2.5}, using a NO_x:PM_{2.5} ratio of 9:1. Transportation conformity trading mechanisms are allowed under 40 CFR § 93.124. The basis for the trading mechanism is the SIP attainment modeling which established the relative contribution of each PM_{2.5} precursor pollutant.

As described in the 2011, Appendix A-2, this trading mechanism would only be used, if needed, for conformity analyses for years after 2014 and, to ensure that the trading mechanism does not impact the ability of the SJV to meet the NO_x budget, the NO_x emissions reductions available to supplement the PM_{2.5} budget would only be those remaining after the 2014 NO_x budget has been met. Clear documentation of the calculations used in the trade would be included in the conformity analysis. *See* 2011 Ozone SIP Revisions, Appendix A-2, p. A-6.

Table J-2 below shows how the revised updated MVEBs were calculated. The baseline inventories are the initial SIP on-road mobile source inventory submitted in the Appendix C of the SJV 2008 PM_{2.5} Plan. These baseline inventories continue to be based on the activity data (e.g. vehicle miles travelled) provided by the SJV 2008 PM_{2.5} Plan as submitted in June 2008.

⁴² The updates to the revised MVEB were in response to EPA's action approving the SJVUAPCD Rule 9510 Indirect Source Review (ISR) on May 9, 2011 (76 FR 26609). In our approval of the rule, we stated that the projected emissions reductions from the rule should not be credited in any attainment and rate of progress/reasonable further progress demonstrations. The updated budgets submitted on May 18, 2011 included reductions from this rule; the revised updated budgets submitted July 29, 2011 do not. The updates also corrected data entry errors in the revised budget calculations

The first adjustment, “State Strategy Adjustment,” incorporates the impacts of both the recession and the reductions from the amended Truck and Bus regulations, the solid waste collection and public fleet vehicles regulations, heavy duty chip re-flash, and heavy duty truck idling regulations, smog check improvements, and reformulated gasoline. The second adjustment, “Adjustments to Baseline,” include the reductions from Assembly Bill 1493 (Pavley – greenhouse gas motor vehicle emissions standards), benefits from the on-road portion of the Carl Moyer program and benefits from the SJV District’s Rule 9310 for School Buses.

Table J-1 Revised Updated PM_{2.5} MVEB for the San Joaquin Valley (tons per average annual day) ¹				
County	2012		2014	
	PM _{2.5}	NO _x	PM _{2.5}	NO _x
Fresno	1.5	35.7	1.1	31.4
Kern (SJV)	1.9	48.9	1.2	43.8
Kings	0.4	10.5	0.3	9.3
Madera	0.4	9.2	0.3	8.1
Merced	0.8	19.7	0.6	17.4
San Joaquin	1.1	24.5	0.9	21.6
Stanislaus	0.7	16.7	0.6	14.6
Tulare	0.7	15.7	0.5	13.8

Source: CARB, 2011 Ozone SIP Revisions, July 21, 2011, p. A-6.
Budgets are rounded up to the nearest tenth ton (0.1).

Table J-2
Calculation of the Revised Updated PM_{2.5} MVEB
for the San Joaquin Valley
 (tons per average annual day)

County		2012		2014	
		PM _{2.5}	NO _x	PM _{2.5}	NO _x
Fresno	Baseline Inventory	1.82	47.82	1.65	40.60
	State Strategy Adjustment	0.36	11.99	0.56	9.07
	Adjustment to Baseline	0.01	0.16	0.02	0.22
	Budget	1.5	35.7	1.1	31.4
Kern (SJV)	Baseline Inventory	2.98	81.58	2.63	70.28
	State Strategy Adjustment	1.14	32.46	1.44	26.29
	Adjustment to Baseline	0.01	0.23	0.01	0.28
	Budget	1.9	48.9	1.2	43.8
Kings	Baseline Inventory	0.59	16.00	0.51	13.52
	State Strategy Adjustment	0.20	5.47	0.26	4.20
	Adjustment to Baseline	0.00	0.05	0.00	0.06
	Budget	0.4	10.5	0.3	9.3
Madera	Baseline Inventory	0.50	12.30	0.46	10.62
	State Strategy Adjustment	0.12	3.14	0.17	2.55
	Adjustment to Baseline	0.01	0.05	0.01	0.07
	Budget	0.4	9.2	0.3	8.1
Merced	Baseline Inventory	1.19	29.15	1.05	24.67
	State Strategy Adjustment	0.40	9.37	0.50	7.16
	Adjustment to Baseline	0.01	0.11	0.01	0.14
	Budget	0.8	19.7	0.6	17.4
San Joaquin	Baseline Inventory	1.39	35.24	1.29	30.27
	State Strategy Adjustment	0.36	10.73	0.46	8.58
	Adjustment to Baseline	0.01	0.11	0.01	0.14
	Budget	1.1	24.5	0.9	21.6

Table J-2 Calculation of the Revised Updated PM_{2.5} MVEB for the San Joaquin Valley (tons per average annual day)					
County		2012		2014	
		PM _{2.5}	NO _x	PM _{2.5}	NO _x
Stanislaus	Baseline Inventory	0.84	22.25	0.76	18.69
	State Strategy Adjustment	0.16	5.58	0.23	4.04
	Adjustment to Baseline	0.00	0.06	0.00	0.07
	Budget	0.7	16.7	0.6	14.6
Tulare	Baseline Inventory	0.75	20.87	0.69	17.88
	State Strategy Adjustment	0.13	5.19	0.21	4.05
	Adjustment to Baseline	0.00	0.07	0.01	0.10
	Budget	0.7	15.7	0.5	13.8

Source: Source: CARB, 2011 Ozone SIP Revisions, July 21, 2011, Appendix C.
Budgets are rounded up to the nearest tenth ton (0.1).

3. EPA's Actions on the MVEB in the SJV 2008 PM_{2.5} SIP

a. April 23, 2010 Budget Adequacy/Inadequacy Finding

On April 23, 2010, we notified CARB that we had found the budgets in the 2008 PM_{2.5} Plan for the RFP milestone years 2009 and 2012 were adequate and that the MVEBs for the attainment year of 2014 were inadequate for transportation conformity purposes. We determined that the attainment year budgets were inadequate because they lacked specificity or enforceability of the emissions reductions relied on to demonstration attainment and therefore did not meet the requirements of our adequacy criteria at 40 CFR § 93.118(e)(4)). *See* letter Deborah Jordan, EPA Region 9, to James Goldstene, CARB, "RE: Adequacy Status of San Joaquin Valley PM_{2.5} Reasonable Further Progress and Attainment Plan Motor Vehicle Emissions Budgets," April 23, 2010. We published a notice of our findings at 75 FR 26749 (May 12, 2010). The finding is available at EPA's transportation conformity website, www.epa.gov/otaq/stateresources/transconf/pastsips.htm.

b. Proposed Action on the MVEBs in the SJV 2008 PM_{2.5} SIP

The April 2010 adequacy determination was based on our preliminary review of the plan. During our subsequent more in depth review of the Plan, we proposed to determined that the 2008 PM_{2.5} Plan did not provide for reasonable further progress as required by CAA section 172(c)(2). 75 FR 74518, 74537. As a result of this determination, we proposed to disapprove the budgets for the RFP years. Specifically, the budgets, when considered together

with all other emission sources, are inconsistent with applicable requirements for reasonable further progress and attainment. 75 FR 74518, 74539.

We also proposed to disapprove the budgets for the attainment year of 2014, which we had already found to be inadequate, based on our initial proposed determination that the SJV 2008 PM_{2.5} Plan does not provide for attainment. *See* 75 FR 74518, 74536.

On July 13, 2011, we proposed to approved the revised updated PM_{2.5} budgets included CARB's proposed 8-Hour Ozone SIP Revisions. *See* 76 FR 41338, 41360. This approval was contingent upon our receipt of a complete SIP submittal containing them. CARB made that complete submittal on July 29, 2011. *See* section I.D.2. of this TSD.

c. Final Action on the Revised Update MVEB

EPA has evaluated the revised updated budgets against our adequacy criteria in 40 CFR § 93.318(e)(4) as part of its review of the budgets' approvability and have found them adequate. *See* Table J-3 below. We post the revised updated budgets on EPA's adequacy review web page on July 14, 2011 and requested comments by August 15, 2011. We received no comments.

We did receive a few comments on the MVEB during the comment period on the 2008 SJV PM_{2.5} SIP. We have reviewed these comment and provided responses to them in section III of this TSD. No issues raised in these comments changed our finding that the MVEB as submitted are consistent with the SIP's attainment and RFP demonstrations or with the applicable requirements of the CAA and EPA regulations.

As discussed in sections II.G. and II.H, we have completed our detailed review of the 2008 SJV PM_{2.5} SIP and supplemental submittals including the 2011 Progress Report. Based on this thorough review of these submittals, we are approving the attainment and RFP demonstrations in the 2008 SJV PM_{2.5} SIP. The revised updated PM_{2.5} MVEB submitted with the 2011 Ozone SIP Revisions are consistent with these attainment and RFP demonstrations and meet all other applicable statutory and regulatory requirements including meeting the adequacy criteria in §93.118(e)(4). EPA, therefore, is approving them.

Now that the approval of the budgets is finalized, the SJV MPOs and the U.S. Department of Transportation are required to use the revised budgets in transportation conformity determinations. Due to the formatting of the budgets (combining emission changes, recession impacts and reductions from control measures) CARB will need to provide the MPOs with emission reductions associated with the control measures incorporated into the budgets for the appropriate analysis years in future conformity determinations so that they can include these reductions per 40 CFR § 93.122. In addition, for these conformity determinations, the motor vehicle emissions from implementation of the transportation plan should be projected and compared to the budgets at the same level of accuracy as the budgets in the plan, for example emissions should be rounded to the nearest tenth (e.g. 0.1 tpd).

d. Final Action on the Trading Mechanism

As noted above, CARB included a trading mechanism to be used in transportation conformity analyses that use the MVEB budgets as allowed for under 40 CFR § 93.124. This trading mechanism allows future decreases in NO_x emissions from on-road mobile sources to offset any on-road increases in PM_{2.5}, using a NO_x:PM_{2.5} ratio of 9:1. As proposed by CARB, the

trading mechanism would only be used, if needed, for conformity analyses for years after 2014. Also, to ensure that the trading mechanism does not impact the ability of the SJV to meet the NO_x budget, the NO_x emissions reductions available to supplement the PM_{2.5} budget would only be those remaining after the 2014 NO_x budget has been met. The trading mechanism will be implemented with the following criteria. The trading applies only to:

- Analysis years after the 2014 attainment year.
- On-road mobile emission sources.
- Trades using vehicle NO_x emissions reductions in excess of those needed to meet the NO_x budget.
- Trades in one direction from NO_x to direct PM_{2.5}.
- A trading ratio of 9 tpd NO_x to 1 tpd PM_{2.5}.

Clear documentation of the calculations used in the trade would be included in the conformity analysis. *See* 2011 Ozone SIP Revisions, Appendix A, p. A-6.

EPA has reviewed the 9:1 NO_x:PM_{2.5} ratio as discussed in section II.D.4. of this TSD, and finds it appropriate ratio for trading between NO_x and direct PM_{2.5} for transportation conformity purpose in the San Joaquin Valley for the 1997 PM_{2.5} NAAQS. We have determined that the method discussed in the documentation is adequate for purposes of assessing the effect of area-wide emissions changes, such as are used in conformity budgets.

EPA believes that the 2008 PM_{2.5} Plan as revised by the 2011 Ozone SIP Revisions includes an approvable trading mechanism for determining transportation conformity after 2014. EPA is approving the trading mechanism and all of the criteria for its use given on page A-6 of the 2011 Ozone SIP Revisions as enforceable components of the transportation conformity program for the SJV for the 1997 PM_{2.5} NAAQS. EPA is also approving the use of this ratio in transportation conformity determinations for the 2006 24-hour PM_{2.5} NAAQS but only until such time EPA finds adequate or approves budgets developed specifically for the 2006 standard.

Table J-2
Evaluation of the Revised Updated Motor Vehicle Emissions Budget
September 2011

Adequacy Review Criteria (40 CFR part 93)		Is Criterion Satisfied?	Reference in SIP Document/Comments
Sec. 93.118(e)(4)(i)	The plan was endorsed by the Governor (or designee) and was subject to a public hearing.	Y	<p>The June 20, 2008 transmittal letter submitting the SJV 2008 PM_{2.5} Plan was sent by CARB's Executive Officer, James Goldstene, the Governor's designee. The transmittal letter indicates that the CARB formally adopted the plan on May 22, 2009, through a Board Resolution (08-28). CARB released the plan on April 25, 2007 and requested public comments. It held a public hearing on the Plan on June 14, 2007.</p> <p>The Plan relies on reduction from measures and commitments in the 2007 State Strategy. The November 16, 2007 transmittal letter submitting the 2007 State Strategy was sent by CARB's Executive Officer, James Goldstene, the Governor's designee. The transmittal letter indicates that CARB adopted the 2007 State Strategy for the SIP on September 27, 2007. CARB released the 2007 State Strategy on April 26, 2007 and May 7, 2007 and requested public comments by the public hearing held on September 27, 2007.</p> <p>CARB updated both the SJV 2008 PM_{2.5} Plan and the 2007 State Strategy in the 2011 Progress Report and 2011 Ozone SIP Revisions. The May 18, 2011 transmittal letter submitting the 2011 Progress Report was sent by CARB's Executive Officer, James Goldstene, the Governor's designee. The transmittal letter indicates that the CARB formally adopted the SIP Revision on April 28, 2011 through a Board Resolution (11-24). CARB released the plan on March 24, 2011 and requested public comments by April 23, 2011 or at the public hearing held on April 24, 2011.</p> <p>The July 29, 2011 transmittal letter submitting the 2011 Ozone SIP Revisions was sent by CARB's Executive Officer, James Goldstene, the Governor's designee. The transmittal letter indicates that the CARB formally adopted the SIP Revision on July 21, 2011 through a Board Resolution (11-22). CARB released the plan on June 20, 2011 and requested public comments by July 20, 2011 or at the public hearing held on July 21 2011.</p>

Table J-2
Evaluation of the Revised Updated Motor Vehicle Emissions Budget
September 2011

Adequacy Review Criteria (40 CFR part 93)		Is Criterion Satisfied?	Reference in SIP Document/Comments
Sec. 93.118(e)(4)(ii)	The plan was developed through consultation with federal, state and local agencies; full implementation plan documentation was provided and EPA's stated concerns, if any, were addressed.	Y	The 2008 PM _{2.5} Plan was developed through consultation with federal, state and local agencies which place with the San Joaquin Valley interagency consultation working group (the Model Coordinating Committee). Members of the consultation group include: EPA, FHWA, FTA, CARB, Caltrans, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD), and each county's Metropolitan Planning Organization (MPO). The 2011 Progress Report and its Appendices A and D which describe the revised MVEB were made available to the MPOs and other agencies for review and comment during the public comment period. EPA received a copy of the draft 2011 Progress Report, the SJV 2008 PM _{2.5} Plan and draft State Strategy but provided no written comments. However, in response to EPA's requests for additional information, CARB provided Attachment A in the CARB Progress Report supplement.
Sec. 93.118(e)(4)(iii)	The motor vehicle emission budgets are clearly identified and precisely quantified.	Y	The updated MVEB for 2012 and 2014 are clearly identified and precisely quantified in Appendix A of the 2011 Ozone SIP Revisions and further described in Attachment A of the May 18, 2011 letter. These budgets reflect control measures that were already adopted at the time the CARB adopted the 2011 Progress Report on April 28, 2011. 2011 Progress Report, Appendix A, p. 3. CARB did not update the MVEB for 2009 because the 2009 budgets are longer needed for any conformity determination in the SJV. 2011 Progress Report, Appendix D.

Table J-2
Evaluation of the Revised Updated Motor Vehicle Emissions Budget
September 2011

Adequacy Review Criteria (40 CFR part 93)		Is Criterion Satisfied?	Reference in SIP Document/Comments
Sec. 93.118(e)(4)(iv)	The motor vehicle emissions budget(s), when considered together with all other emission sources, is consistent with applicable requirements for reasonable further progress and attainment.	Y	<p>EPA has concluded that the updated budgets for the year 2012 when considered together with all other emission sources are consistent with the requirement to demonstrate reasonable further progress for the 1997 annual and 24-hour PM_{2.5} standards. This finding is based on review of the revised RFP demonstrations in Appendix C (Table C-1) of the 2011 Progress Report. As documented in Section II.H. of this TSD, EPA is approving the revised RFP demonstration.</p> <p>EPA has concluded that the updated budgets for the year 2014 when considered together with all other emission sources are consistent with the requirement to demonstrate expeditious attainment of the 1997 annual and 24-hour PM_{2.5} standards. This finding is based on review of the revised attainment demonstrations in the 2011 Progress Report. As documented in Section II.G. of this TSD, EPA is approving the revised attainment demonstration.</p> <p>The revised updated MVEBs for direct PM_{2.5} do not include emissions from re-entrained road dust (paved and unpaved) or road/transit construction activities. The 2008 SJV PM_{2.5} plan, pp. 7-5 & 7-6, concluded that neither are significant contributors to PM_{2.5} emissions in the SJV. EPA agrees that re-entrained road dust is not a significant contributor to PM_{2.5} emissions in the San Joaquin Valley.</p> <p>There are no budgets for the PM_{2.5} precursor SO_x because on-road vehicles are projected to be an insignificant contributor to PM_{2.5} levels in the SJV in both 2012 and 2014. 2008 SJV PM_{2.5} plan, pp. 7-5. There are no budgets for the PM_{2.5} precursors VOC and ammonia because they are not considered attainment PM_{2.5} precursors in the SJV and thus are not required to be controlled for PM_{2.5} attainment. See SJV PM_{2.5} plan, pp. 7-4 & 7-5 and section II.C. of this TSD.</p>

Table J-2
Evaluation of the Revised Updated Motor Vehicle Emissions Budget
September 2011

Adequacy Review Criteria (40 CFR part 93)		Is Criterion Satisfied?	Reference in SIP Document/Comments
Sec. 93.118(e)(4)(v)	The plan shows a clear relationship among the emissions budget(s), control measures and the total emissions inventory.	Y	The emissions inventory for all stationary, area, on-road mobile, and non-road mobile sources, and their relation to control measures and the reductions from existing measures are described in Appendix A of 2007 State Strategy and Appendix B of the SJV 2008 PM _{2.5} Plan as updated by 2011 Progress Report. The final inventories incorporating the reductions from adopted measures are given in Tables B-1 and B-2 in Appendix B to the SJV 2008 PM _{2.5} Plan and Appendix A, D and E of the 2011 Progress Report and Attachment A in the CARB Progress Report supplement.
Sec. 93.118(e)(4)(vi)	Revisions to previously submitted control strategy or maintenance plans explain and document any changes to any previous submitted budgets and control measures; impacts on point and area source emissions; any changes to established safety margins (<i>see</i> §93.101 for definition), and reasons for the changes (including the basis for any changes to emission factors or estimates of vehicle miles traveled).	Y	CARB submitted revisions to the attainment and RFP demonstration in the SJV 2008 PM _{2.5} Plan as part of the 2011 Progress Report. <i>See</i> Appendices A – D and Attachment A in CARB Progress Report supplement. Attachment A specifically documents the changes in the planning factors, the new heavy duty truck inventory and the revisions to the control measures included in the updated budgets from the original budgets. EPA analyzed the information included in these reports to confirm that the updated MVEB are consistent with previous MVEB and revised as documented Note that CARB did not update the MVEB for 2009 because the 2009 budgets are longer needed for any conformity determination in the SJV. 2011 Progress Report, Appendix D.
Sec. 93.118(e)(5)	EPA has reviewed the State's compilation of public comments and response to comments that are required to be submitted with any implementation plan.	Y	The 2008 PM _{2.5} Plan contains public comments and SJVUAPCD responses in appendix J to the Plan. Additional verbal comments were received during the adoption public hearings held by the SJVUAPCD and CARB and are also included as attachments to the June 2008 SIP submittal. Additional written and verbal comments were received during the public comment period and public hearing on the 2011 Progress Report. <i>See</i> CARB Resolution 11-24, p. 3. We have reviewed the compilation of comments and responses and find the responses (where provided) to be acceptable. No issues that might have affected our adequacy finding remain unanswered.

III - Responses to Comments

List of Comment Letters Received

We received eleven comment letters in response to our November 30, 2010 proposal (75 FR 74518) and two comments letters in response to our July 13, 2011 amended proposal (76 FR 41338).

Commenters on the November 30, 2010 proposal were:

1. [AIR] Brent Newell, General Counsel, Center on Race, Poverty & the Environment, January 31, 2011, “Comments on Proposed Action on the 2008 San Joaquin Valley State Implementation Plan for Fine Particulate Matter and 2007 State Strategy, Docket No. EPA-R09-OAR-2010-0516)” with enclosures. These comments were joined by Tom Frantz, President, Association of Irrigated Residents (AIR); Martha Guzman, California Rural Legal Assistance Foundation; Catherine Garoupa White, Director Central Valley Air Quality Coalition; Maria Covarrubias, President, Comité Residentes Organizados al Servicio del Ambiente Sano; Salvador Partida, Co- Chair, Committee for a Better Arvin; Bradley Angel, Director, Greenaction for Health & Environmental Justice; Adriano Martinez, Staff Attorney, Natural Resources Defense Council; and Marylia Kelly, Executive Director, Tri-Valley CAREs.
2. Petition signed by 707 residents of the SJV and Ventura County in support of AIR’s January 31, 2011 letter.
3. [Earthjustice]. Paul Cort, Staff Attorney, and Sarah Jackson, Research Associate, Earthjustice, January 31, 2011, “Comments on EPA’s Partial Approval/Disapproval of the San Joaquin Valley’s State Implementation Plan for Fine Particulate Matter, Docket # EPA-R09-OAR-2010-0516” with enclosures. Comments are submitted on behalf of Medical Advocates for Healthy Air, Fresno Metro Ministries, the California Rural Legal Assistance Foundation, Sierra Club, Natural Resources Defense Council, Tri-Valley CAREs; the Central Valley Air Quality Coalition, and the Central Valley Air Quality Coalitions’ Watchdog Committee.
4. [SJVUAPCD]. Seyed Sadredin, Executive Director/Air Pollution Control Officer, January 31, 2011, RE: Approval and Promulgation of Implementation Plans; State of California; 2008 San Joaquin Valley State Implementation Plan for Fine Particulate Matter; 2007 State Strategy; PM_{2.5}; Proposed Rule (Docket Number: EPA-R09-OAR-2010-0516).
5. [CARB modeling supplement]. John DaMassa, Chief, Modeling and Meteorology Branch; California Air Resources Board, January 28, 2011, Attention: Docket No. EPA-R09-OAR-2010-0516) with enclosure.
6. [CARB]. James N. Goldstene, Executive Officer, California Air Resources Board, January 31, 2011, Attention: Docket No. EPA-R09-OAR-2010-0516 with enclosures.
7. Tom Frantz, President, Association of Irrigated Residents (AIR), January 31, 2011, Re: Docket number EPA-R09-OAR-2010-0516
8. Email, Arthur D. Unger, December 12, 2010, Subject: Docket number 40 CFR Part 52 [EPA-R09-OAR-2010-0516; FRL-9229-4].

Commenters on the July 13, 2011 proposal were:

1. [AIR]. Brent Newell, General Counsel, Center on Race, Poverty & the Environment, August 12, 2011, “Comments on Proposed Action on the 2008 San Joaquin Valley State Implementation Plan for Fine Particulate Matter and 2007 State Strategy, Docket No. EPA-R09-OAR-2010-0516)” with enclosures. These comments were joined by Tom Frantz, President, AIR; Kevin Hall, Director, Central Valley Air Quality Coalition; Maria Covarrubias, President, Comité Residentes Organizados al Servicio del Ambiente Sano; Salvador Partida, Co- Chair, Committee for a Better Arvin; Bradley Angel, Director, Greenaction for Health & Environmental Justice; and Adriano Martinez, Staff Attorney, Natural Resources Defense Council.
2. Petition signed by approximately 579 residents of the SJV and Ventura County in support of AIR’s August 12, 2011 letter.
3. [Earthjustice]. Paul Cort, Staff Attorney, and Sarah Jackson, Research Associate, Earthjustice, August 12, 2011, “Comments on EPA’s Partial Approval/Disapproval of the San Joaquin Valley’s State Implementation Plan for Fine Particulate Matter, Docket # EPA-R09-OAR-2010-0516” with enclosures.

A. General Comments

Comment: In its August 2011 letter, Earthjustice comments that EPA has proposed to approve “without support” elements of the Plan that it had previously rejected for failing to meet the requirements of the Clean Air Act and further comments that EPA should disapprove the Plan and require a new plan be developed that meets the requirements of the Clean Air Act.

Response: In November 2010, EPA proposed to disapprove most elements of the SJV 2008 PM_{2.5} SIP. These proposed disapprovals were based for the most part on too high a percentage of the emissions reductions needed for attainment remained as commitments; inadequate documentation of the air quality modeling which meant that the attainment target was not adequately supported; and volatile organic compounds (VOC) controls were not included in the plan although available information indicated that VOC controls would be effective in reducing PM_{2.5} levels in the SJV. *See in general*, 75 FR 74518 (November 30, 2010).

Since EPA’s proposal last November, California has provided additional documentation and made a number of submittals to address the EPA’s proposed disapproval. These include additional documentation on the air quality modeling, additional analysis of existing data that indicates additional VOC controls would not be effective at reducing PM_{2.5} levels in the SJV, revisions to the reasonable further progress (RFP) demonstration based on updated inventories, and an update on the State’s progress in meeting its commitments. *See* CARB modeling supplement, Goldstene January 31, 2011 letter, and 2011 Progress Report. The State has also submitted its Truck rule⁴³ for approval into the SIP under EPA’s SIP parallel process.⁴⁴ EPA

⁴³ The “Truck rule” is CARB’s Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles,” Title 13, California Code of Regulations (CCR), section 2025, adopted December 11, 2008 and amended December 16, 2010. For a description of the Truck rule’s requirements, *See* EPA’s proposed approval at 76 FR 40652, 40654 (July 11, 2011).

proposed to approve that rule on July 11, 2011. 76 FR 40652. EPA has also approved or proposed to approve a number of District rules which provide for NO_x and PM_{2.5} reductions in the SJV. *See* Table 2 at 76 FR 41338, 41344. All these rule actions have served to reduce the percentage of the emissions reductions remaining as commitments.

In our July 13, 2011 proposal and the 2011 Proposal TSD,⁴⁵ we explained how these new State documents and submittals and our actions on the rules have remedied most of the problems that we identified in our initial proposal on the SJV 2008 PM_{2.5} Plan. EPA provided ample support for its proposed approval of those elements of the Plan that we had previously proposed to disapprove.

B. Emissions Inventory

Comment: Earthjustice comments on the importance of emission inventories, noting that CAA section 172(c)(3) requires that nonattainment plans “include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area.” Earthjustice objects to EPA’s proposal to approve the inventories in the 2008 PM_{2.5} SIP because they were current and accurate “at the time the Plan was developed and submitted,” arguing that such language is not in the CAA and is not a reasonable extension of Congress’s intent, which is to ensure the adoption and approval of SIPs that will achieve clean air meeting the NAAQS. Earthjustice argues that an inventory that is “known to be wrong” undermines the modeling demonstration of the emission reductions needed to attain, and that EPA’s interpretation suggests that revisions to an inventory are needed only when it is found that the inventory is not current or accurate as of the date it is submitted. Earthjustice argues that such an interpretation undermines any assurance that “the requirements of [Part D of the CAA] are met.”

Response: EPA does not dispute the importance of emissions inventories. We evaluated the emissions inventories in the 2008 PM_{2.5} Plan to determine whether they satisfy the requirements of CAA section 172(c)(3) and adequately support the Plan’s RACM, RFP and attainment demonstrations. Based on this evaluation, we have concluded that the Plan’s 2005 base year emission inventory was based on the most current and accurate information available to the State and District at the time the Plan was developed and submitted and comprehensively addresses all source categories in the SJV area, consistent with applicable CAA requirements and EPA guidance. *See* 76 FR 41338, 41342-41343 and 2011 Proposal TSD at section II.A.; *see also* “General Preamble for Implementation of Title I of the Clean Air Act Amendments of 1990,” 57 FR 13498, 13502 (April 16, 1992) (“General Preamble”).

We do not agree with Earthjustice's suggestion that EPA interprets the CAA to require revisions to an emissions inventory only when it is found that such inventory is not current or accurate as of the date it is submitted. Significant changes to a base year inventory that undermine the assumptions in an attainment demonstration may, on a case by case basis, call for a reevaluation of the modeling or other planning analyses supporting that demonstration. In this

⁴⁴ *See* letter, James N Goldstene, Executive Officer, CARB to Jared Blumenfeld, Regional Administrator, May 19, 2011.

⁴⁵ The 2011 Proposal TSD is the “Technical Support Document for the Revised Proposed Rulemaking Action on the San Joaquin Valley 2008 PM_{2.5} Plan and the San Joaquin Valley Portions of the Revised 2007 State Strategy,” Air Division, U.S. EPA, Region 9, June 29, 2011.

case, however, as discussed in the proposed rule (76 FR 41562, 41567) and below, we have concluded that the State's changes to its methodologies for estimating future emissions do not significantly affect the 2002 base year inventories and, consequently, do not undermine the modeling or other analyses that rely on those inventories and that support the attainment demonstration in the Plan. Based on this technical assessment, we have concluded that it is not necessary in this case for the State to submit a revised base year inventory. We note that states are required to report comprehensive emissions inventories to EPA every three years under the Air Emissions Reporting Requirements in 40 CFR part 51, subpart A. *See* 40 CFR § 51.30(b).

CAA section 172(b) provides that “the *State* containing [a nonattainment] area *shall submit* a plan or plan revision (including the plan items) meeting the applicable requirements of [section 172(c) and section 110]” on the schedule established by EPA, and section 172(c) contains, *inter alia*, the requirement that nonattainment plans “shall include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area.” We believe it is reasonable to read these provisions together as requiring that the State submit an inventory that is “comprehensive, accurate, [and] current” at the time the State submitted it to EPA, rather than requiring that the State continually revise its plan as new emissions data becomes available. *See* Brief of Respondents, EPA, in *Sierra Club, et al. v. U.S. EPA, et al.*, Case Nos. 10-71457 and 10-71458 (consolidated), May 5, 2011. States could never effectively plan for air quality improvements if they had to constantly revise their inventories as new data became available. Air quality planning is an iterative process and states and EPA must rely on the best available data at the time the plans are created.

Comment: Earthjustice asserts that CARB has reviewed and updated its emissions estimates for both on-road and off-road diesel equipment categories and “discovered that it had radically overestimated emissions from” these categories. Using the information in the 2010 Off-Road rule ISOR (p. 2),⁴⁶ Earthjustice calculates the reduction in the SJV 2005 off-road equipment inventory from these updates as 28.2 tpd of NO_x and 1.4 tpd of PM_{2.5}. Using information in the 2010 Truck Rule ISOR, p. 19,⁴⁷ it calculates the reduction in the SJV 2005 inventory for sources subject to the rule from these updates as approximately 25 tpd of NO_x and 1 tpd of PM_{2.5}. Based on its calculations, Earthjustice asserts that CARB's updated emissions estimates reduce the Plan's 2005 inventory by 9 percent for NO_x and 3 percent for PM_{2.5} rather than the estimates of 6 percent for NO_x and 5 percent for PM_{2.5} provided by CARB in its Progress Report supplement.⁴⁸ Earthjustice claims that no documentation is provided for these revised base year estimates and

⁴⁶ CARB Staff Report: Initial Statement of Reasons [ISOR] for Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and the Off-Road Large Spark-Ignition Fleet Requirements, October 2010, incl. Appendix D1 (“2010 Off-Road Rule ISOR”). The Off-Road rule is CARB's “Regulation for In-Use Off-Road Diesel-Fueled Fleets,” Title 13 CCR sections 2449 through 2449.3. The Off-Road rule was initially adopted on July 26, 2007 and amended on July 23, 2009 and December 16, 2010. For a description of the Off-Road rule's requirement, *See* 2010 Off-Road Rule ISOR, section IV. The 2010 Off-Road Rule ISOR also describes changes to the CARB's Large Spark Ignition Engine Fleet Requirements (“LSI fleet regulation”), Title 13 CCR sections 2775 through 2775.2.

⁴⁷ CARB, Staff Report: Initial State of Reasons for Proposed Rulemaking, Proposed Amendments to the Truck and Bus Regulations, The Drayage Truck Regulation and the Tractor-Trailer Greenhouse Gas Regulation, October 2010 (“2010 Truck Rule ISOR”).

⁴⁸ Letter, Lynn Terry, Deputy Executive Office, CARB, to Elizabeth Adams, Deputy Director, Air Division, EPA-Region 9, May 18, 2011. (“CARB Progress Report supplement”).

that the numbers CARB has provided do not match with the statements in the 2010 Off-Road Rule ISOR and 2010 Truck Rule ISOR. It states that EPA should provide documentation of these adjustments to clarify the effect the diesel rule changes had on the base year inventory.

Response: To calculate its estimate of the change to the 2005 year inventory that results from non-recession related changes to the off-road equipment inventory, Earthjustice relies on the following statement in the 2010 Off-Road Rule ISOR, p.2, *See also*, p. 19:

“[t]he net result of the recession and methodology changes was an almost 80 percent reduction in emissions from what had previously been estimated, with about half of this reduction the result of the recession, and about half to changes in inventory methods.”

It takes the half of the 80 percent due to changes in inventory (40 percent) and applies it the 2005 emissions estimate for “off road equipment category” (70.4 tpd NO_x and 3.5 tpd PM_{2.5}) from the 2008 PM_{2.5} Plan, Appendix B, resulting in its reductions estimates of 28.1 tpd NO_x and 1.4 tpd PM_{2.5}. Earthjustice’s calculations, however, err by applying the 40 percent factor to the entire “off road equipment category” rather than the subset of the category subject to the off-road rule and by applying a statewide average to the SJV inventory.

CARB’s estimates of reductions due to recession and non-recession factors are for the emissions from sources subject to the off-road engine rule and not for entire “off-road equipment” category. Off-road equipment subject to the rule account for approximately 70 percent of the emissions in the off-road equipment category.⁴⁹ Applying the 40 percent factor (which itself is a rough estimate) to the correct fraction of the off-road equipment category, the estimated reductions are 20 tpd of NO_x and 1.0 tpd of PM_{2.5}.

In addition, CARB’s revisions to the inventories included revisions to the allocation of the equipment population by air basin. *See* Off-Road Rule ISOR, Appendix D, pp. 30-33. For both the construction and mining and industrial equipment categories, SJV saw a significant increase in the percentage of the equipment population allocated to it. For example, the SJV’s allocation of the State’s construction equipment population increased from 9.8 percent to 13.8 percent. *Id.*, p. 31. As a result, the adjustment due to non-recession impacts is smaller for SJV than for the State as a whole.

For the entire category of off-road sources (which includes emissions from trains, planes, recreational equipment, farm equipment in addition to off-road equipment), CARB estimated a net change in the 2005 emissions inventory of 22 tpd NO_x and 1 tpd PM_{2.5}. *See* 2011 Progress Report Supplement, Attachment 1. Because CARB made only limited revisions to the other source categories within the overall off-road mobile source category, the net change in the overall category represent mostly the change to the off-road equipment category. Thus the figures given in the 2011 Progress Plan Supplement (22 tpd NO_x and 1 tpd PM_{2.5}) and the figures from Earthjustice’s rough estimates based on statewide information in the Off-Road Rule ISOR (24.5 tpd NO_x and 1.2 tpd PM_{2.5}) are consistent.

⁴⁹ The off-road equipment category includes emissions from natural gas and gasoline powered industrial and commercial equipment as well as emissions from logging equipment, lawn and garden equipment and transportation refrigeration units that are not subject to the off-road equipment rule. *See* “Inventory of Off-Road Equipment Subject to the Off-Road rule,” September 28, 2011. Data from CARB’s on-line emissions almanac at <http://www.arb.ca.gov/ei/emissiondata.htm>.

To calculate its estimate of the change to the 2005 year inventory that results from non-recession related changes to the truck and bus inventory, Earthjustice relies on the following statement in the 2010 Truck Rule ISOR, p. 19:

Changes to emissions inputs independent of the recession, including out-of-state VMT estimates and lifetime mileage assumptions reduced baseline emissions by about 10 percent from what was assumed in 2008.

It takes the 10 percent figure and applies it to the emissions estimates of 249.4 tpd NO_x and 9.9 tpd PM_{2.5} that it took from 2008 PM_{2.5} Plan, Appendix B to reach its estimates of 25 tpd NO_x and 1 tpd PM_{2.5}.⁵⁰ Earthjustice, however, erred in its calculations by applying this statewide average 10 percent figure to the inventory in the 2008 PM_{2.5} Plan.

CARB calculated the 10 percent reduction figure not from the SIP inventory but from the revised truck and bus inventory it developed for its initial adoption of the Rule in 2008. The key phrase in the quote cited above that indicates this is “from what was assumed in 2008.” Prior to adopting the rule in 2008, the State reviewed and updated the inventory for trucks and buses. *See* 2008 Truck Rule ISOR, Appendix G. This review resulted in an approximately 10 percent increase in the statewide baseline inventory for the categories of trucks and buses subject to the rule from the levels assumed in the SIP.⁵¹ In effect, the recent inventory revisions returned the inventory, if recession-impacts are excluded, to the levels assumed initially in the SIP.

We note that the statewide average of 10 percent masks the effects of these revisions on truck emissions in specific areas. One of the most significant changes to the truck inventory was a reduction in the estimate of VMT by interstate trucks. *See* 2010 Truck Rule ISOR, pp. 18-20. San Joaquin has the highest fraction of interstate truck VMT of any area in California and thus its truck inventory was impacted more by this change than the truck inventories for other areas. *See* 2010 Truck Rule ISOR, Appendix G, p. 30. CARB estimated baseline truck emissions in the SJV decreased approximately 13 tpd NO_x and 2 tpd of PM_{2.5} in 2005 due to the non-recession changes to the truck inventory.

We summarize the above calculations in the Table III-1 below. This table shows that when Earthjustice’s estimates are revised to correctly reflect the information in the ISOR’s, they show less of an impact on the inventory than CARB estimated.

⁵⁰ Earthjustice does not list the specific source categories whose emissions it summed to reach these figures; however, it appears that it included emissions from the heavy-heavy duty diesel trucks, medium-heavy duty diesel trucks, light-heavy duty diesel trucks, urban buses (both gas and diesel), school buses, and other bus categories. The Truck rule, however, does not apply to light-heavy duty diesel trucks or urban buses. *See* CARB, *Staff Report: Initial State of Reasons for Proposed Rulemaking, Proposed Regulation for In-Use On-Road Diesel Vehicles*, October 2008 (“2008 Truck Rule ISOR”), Appendix G, Table 1. Subtracting emissions from these source categories results in emissions of 238.2 tpd NO_x and 9.8 tpd PM_{2.5}.

⁵¹ The 2008 Truck Rule ISOR, Appendix G at p. G-63 gives a 2008 baseline statewide estimate of 860 tpd NO_x for the truck and bus categories subject to the Rule while the 2007 State Strategy Appendix A, p. 116 gives an estimate of 780 tpd NO_x. State Strategy number is the sum of MHDDT, HHDDT, school bus, and other bus categories.

Table III-1 Comparison of Effect of Non-Recession Impact on the Base Year Emissions Inventory for Selected Categories (tons per average annual day)								
	Change in Truck & Bus Inventory (tpd)		Change in Off-Road Equipment Category (tpd)		Total Change in Emissions (tpd)		Percent Change in Overall Inventory	
	NO _x	PM _{2.5}	NO _x	PM _{2.5}	NO _x	PM _{2.5}	NO _x	PM _{2.5}
Earthjustice estimate	25	1	28.2	1.4	53.2	2.4	9%	3%
Earthjustice estimate revised	0	0	20	1.0	20	1.0	3.5%	1.1%
CARB estimates	13	2	22	1	37*	4*	6%	5%

* Net change in on and off-road inventories from 2011 Progress Report Supplement, Attachment 1, p. 1 (SJV 2005 Inventory).

CARB provides extensive documentation on its revisions to the truck, bus, and affected off-road equipment categories in the 2010 Truck Rule ISOR, Appendix G and 2010 Off-Road Rule ISOR, Appendix D.

Comment: Earthjustice provided the following table of inventory numbers in its comment letter in support of its contention that CARB's revised inventories are not consistent with the information in the 2010 Truck ISOR and the 2010 Off-Road Rule ISOR:

SJV PM_{2.5} Plan Inventory Numbers (tpd)					
	2005 SIP*	2009 SIP*	2009 Revised	2014 SIP*	2014 Revised
Truck & Bus Rule Sources	249.4 NO _x 9.89 PM _{2.5}	241 NO _x 9.1 PM _{2.5}	(no numbers found)	165 NO _x 6.3 PM _{2.5}	88.6 NO _x *** 1.9 PM _{2.5} ***
Off-Road Rule Sources	70.4 NO _x 3.5 PM _{2.5}	58.8 NO _x 2.9 PM _{2.5}	12 NO _x ** 0.5 PM _{2.5} **	44.3 NO _x 2.0 PM _{2.5}	14 NO _x ** 0.6 PM _{2.5} 5**

* Source: 2008 PM_{2.5} Plan, Appendix B

** Source: 2010 Off-Road Rule ISOR, Appendix D at D-48.

*** Source: 2010 Truck Rule ISOR, Appendix G at G-57.

Earthjustice also notes that Appendix G's Table 36 identifies different revised baseline numbers for the off-road equipment source category for 2014 than were provided in Appendix D of the 2010 Off-Road Rule ISOR. It claims that there is no explanation for this discrepancy. We have used the figures from Appendix D.

Response: EPA reviewed the numbers on Earthjustice's table and notes the following:

Truck rule sources: As we noted in footnote 7, Earthjustice included emissions from the light heavy duty diesel truck, the urban gas bus and urban diesel bus categories in its SIP numbers, although all three categories are not regulated by the Truck rule.

Off-Road rule sources: As we also noted above, only about 70 percent of the emissions in the off-road equipment category are from equipment that is subject to the Off-Road rule. Earthjustice's numbers assumes that all the emissions in the off-road equipment category are subject to the rule.

Earthjustice claims that there is an unexplained discrepancy in the revised baseline numbers for off-road sources for 2014 between Table 36 in the 2010 Truck Rule ISOR Appendix G and the 2010 Off-Road Rule ISOR, Appendix D. The only baseline numbers for off-road equipment on Table 36 are from the unrevised pre-rule SIP inventory. The other numbers on Table 36 are the estimated post-rule levels emissions levels for the Off-Road rule as originally adopted ("Adopted") and as proposed for revision ("Proposed"). Appendix D (Table 5, p. D-48) shows updated emissions estimates and compares the updated baseline with the regulation scenario. The only overlap between Table 36 and Appendix D is the "Proposed" column on Table 36 and the "Regulation" column on Table 5. The first gives the 2014 NO_x reduction as 12.4 tpd and the second gives the value as 12 tpd. The PM_{2.5} values are identical. The difference between the two is simply how the NO_x numbers are displayed. On Table 36, NO_x reductions are given to the first decimal place (12.4 tpd) while on the Table 5, they are given rounded to a whole number (12 tpd).

Comment: Earthjustice asserts that "EPA cannot approve these inventories as complying with the requirements of section 172(c)(3) knowing that the data are not valid for purposes of building an attainment plan."

Response: EPA evaluated the effect of the inventory changes on the RFP and attainment demonstration and determined that the inventory changes would not affect their approvability. See 2011 Proposal TSD, sections II.B.5. and II.H.4. We therefore disagree with the assertion that we are approving these inventories "knowing that the data are not valid for purposes of building an attainment plan."

Comment: Earthjustice asserts that even if EPA approves the inventories, such approval "cannot be used as an excuse to build a revised plan on these data" and that any new PM_{2.5} plan "must include updated inventories that reflect the best data available at that time." It requests that EPA be clear in its final action on the 2008 PM_{2.5} Plan that future plan revisions must be based on updated inventories.

Response: The SJV was designated nonattainment for the 2006 24-hour PM_{2.5} standard in December 2009 and a new plan to address that standard is due in December 2012. As we stated in our 2011 proposal, we expect California will base this new plan for attaining the 2006 24-hour PM_{2.5} standard on the most comprehensive, accurate, and current emissions inventory of actual emissions available at the time it develops and submits that plan. 76 FR 41338, 41343.

Comment: Throughout its comments, AIR uses the term "recession reductions" which it defines as "the emission reductions the [C]ARB claims have occurred as a result of the recession."

Response: In its comments, AIR calculates what it considers "the total reductions from baseline reductions without recession reductions" as 11 tpd of PM_{2.5}, 195 tpd of NO_x, and 0.9 tpd of SO_x. These figures are the same as the calculated reductions from the baseline measures prior to the

updates to the 2014 baseline inventory.⁵² Based on these calculations, AIR seems to consider the “recession reductions” to be the difference between the 2014 baseline inventory submitted with the 2008 PM_{2.5} Plan in 2008 and the revised 2014 baseline inventory submitted with the 2011 Progress Report in 2011. By labeling this difference as “recession reductions,” AIR attributes the difference entirely to revisions to the economic forecasts. This is not entirely correct.

Changes to the 2014 baseline inventory include revisions not only to the economic forecasts but also to a variety of other factors (out-of-state vehicle miles traveled (VMT) estimates, cumulative mileage, equipment populations, load factors, and hours of use, etc.) used to calculate emissions from the trucks, buses, and certain off-road equipment categories. *See* 2011 Progress Report, Appendix E. CARB estimates that revisions to the truck inventory excluding recession impacts reduced truck emissions statewide by 10 percent from the 2014 baseline levels estimated when the Truck rule was adopted in 2008 while recession impacts reduced the baseline level by a further 7 percent. *See* 2010 Truck Rule ISOR, p. 19. For off-road equipment, CARB estimates that inventory changes independent of the recession were responsible for half the overall reduction in projected statewide emissions. *See* 2010 Off Road Rule ISOR, p. 17. We note that these figures are average statewide figures and not specific to the SJV.

Comment: AIR contends that in the 2011 Progress Report, CARB first claims that the reduced economic activity caused by the recession has reduced 2014 emissions levels in the SJV by 2.7 tpd of PM_{2.5}, 63.1 tpd NO_x and 0.1 tpd of SO_x. AIR further contends that CARB claims that the recession has caused current inventories of the goods movement and construction sectors to be lower than projected in the 2008 PM_{2.5} Plan. Finally, citing EPA’s statement in the 2011 Proposal TSD about the effect of the 2007-2009 economic recession on activity levels in the State’s construction and goods movement sectors, AIR asserts that accounting for the recession through inventory adjustments is improper.

Response: CARB does not claim that the recession alone has reduced the projected 2014 baseline emissions in the SJV nor did it provide the numbers cited by AIR. As discussed in the response to the preceding comment, revisions to the baseline inventory took into account not only changes to the State’s economic forecasts but also updated information on out-of-state VMT estimates, cumulative mileage, equipment populations, and other data used to calculate emissions from trucks, buses, and certain off-road equipment. The emissions reduction figures that AIR ascribes to CARB are figures EPA calculated using data provided by CARB.

EPA uses the phrase “adjustments to the baseline” to refer to the difference between the 2014 baseline initially submitted in the 2008 SJV PM_{2.5} Plan and the recently revised 2014 baseline as submitted in the 2011 Progress Report. This “adjustments to baseline” figure is nothing more than EPA’s summary of the overall impact of both recession and non-recession related changes between the two projected inventories. EPA calculated this adjustment from

⁵² *See* line D on Table 7 in the November 30, 2010 proposed action on the SJV PM_{2.5} SIP at 75 FR 74518. On this table, the baseline NO_x reductions are listed as 199.2 tpd but include 4.2 tpd of uncreditable reductions that are not included in AIR’s numbers. By “baseline inventories” or “projected baseline inventories,” we mean projected emissions inventories for future years that account for, among other things, the ongoing effects of economic growth and adopted emissions control requirements. A 2014 baseline inventory is important because this year is the “attainment year,” the year by which all reductions needed for attainment need to be in place for the SJV. *See* 40 CFR 51.1007(b).

summary data CARB provided in Appendix E of the 2011 Progress Report. The adjustment represents the net results of CARB's changes to its inventories rather than the changes themselves.

CARB revised its inventories for trucks and diesel off-road equipment to incorporate new and better data including new research on truck travel within California. *See* 2010 Truck Rule ISOR, Appendix G. These revisions were not mere adjustments to previous inventories but thorough reviews of much of the data that goes into estimating emissions from these sources. *See* 2010 Truck Rule ISOR, Appendix G and 2010 Off-Road Rule ISOR, Appendix D.⁵³ These inventory revisions also included review of current and future activity data (such as fuel consumption, diesel fuel sales, trucking industry tonnage reports, truck sales trends, and truck registration data) for these categories as well as economic forecasts from a number of reputable sources.⁵⁴ Throughout its development of these revisions, CARB held workshops seeking public review and input into its work. *See* 2010 Truck Rule ISOR, p. 13. In all, the result of CARB's efforts is a more accurate 2014 baseline emissions inventory for the SJV.

Emission projections are a function of change in activity (growth or decline) combined with changes in the emission rate or controls applicable to emission sources. Projected inventories are, therefore, necessarily affected by forecasts of industrial growth, population growth, and transportation growth, among other factors.⁵⁵ EPA guidance emphasizes the importance of developing reliable methods for estimating future source activity levels as part of the SIP planning process.⁵⁶

We disagree with AIR's assertion that "EPA claims that the [C]ARB has opted to take credit for the decrease in the inventory in the attainment demonstration as 'a line-item adjustment to the baseline inventories.'" EPA stated in the 2011 Proposal TSD (pg. 18) that "California is reflecting these recession impacts as a line-item adjustment to the baseline inventories." This statement was incorrect and should have read that EPA (not CARB) is reflecting the recession impacts as a line-item adjustment to the baseline inventories. EPA believes this adjustment is appropriate in light of the impact of these emissions changes on the baseline. We should have also been clearer that the 2014 adjustments included the technical revisions to the inventory that are discussed on page 19 of the 2011 Proposal TSD.

Finally, we note that although AIR objects categorically to the revisions to the projected emission inventories based on CARB's revised economic forecasts, it provides no information to

⁵³ For an overview of these changes and their results, *See* the presentation to the CARB Board by CARB's Planning and Technical Support Division on November 18, 2010, entitled, "Diesel Inventory Improvements for Regulatory Development," available at <http://www.arb.ca.gov/board/books/2010/111810/10-10-9pres.pdf> and in the EPA's docket for this rule.

⁵⁴ *See* CARB, "ARB Staff Assessment of the Impact of the Economy on California Trucking Activity and Emissions 2006-2014," draft December 2009, available in the docket for this rule. Sources of economic data included California Department of Finance, California Legislative Analyst's Office, California Energy Commission, UCLA Anderson School, Beacon Economics, University of the Pacific, Congressional Budget Office, and US Energy Information Agency. *Id.* pp. 11-12.

⁵⁵ *See* "Emission Projections," STAPPA/ALAPCO/EPA Emission Inventory Improvement Project, Volume X (December 1999) at 1-1 (available at <http://www.epa.gov/ttnchie1/eiip/techreport/volume10/x01.pdf>).

⁵⁶ *See* "Procedures for Preparing Emissions Projections," EPA Office of Air Quality Planning and Standards, EPA-450/4-91-019 (July 1991) at pg. 6 and section III.

refute CARB's extensive documentation of the impact of the economic recession on air pollution generating activity. It also provides no information to refute CARB's non-recession related revisions to the projected inventories.

C. Air Quality Modeling

Comment: Earthjustice comments that the inventory is used to calibrate models of the air pollution problem by looking at the emissions inventory for a specific year that resulted in the ambient concentrations measured during that same year. It argues that having an accurate and current inventory is therefore critical to determining the nature of the pollution problem and the reductions that will be needed to attain the national standard.

Response: EPA agrees with the commenter that an accurate and current inventory is a crucial input to the development of the model application and attainment demonstration (although we note that it is more accurate to say the emissions inventory for a specific year drives the model predictions, and ambient concentrations during that same year are then used to assess the accuracy of the model). However, as discussed below, EPA concluded that these recent changes do not affect our evaluation of the attainment demonstration in the 2008 PM_{2.5} Plan.

Comment: Earthjustice objects to EPA noting that the District claimed substantial fugitive dust control as a justification for using a variation on EPA's Speciated Modeled Attainment Test (SMAT), give an alleged EPA finding that the District's dust controls are not substantial.

Response: EPA believes the issue of the adequacy of the District's dust control regulations is moot in this context. EPA did note a Plan statement about fugitive dust controls and SMAT, but that statement is in the context (2008 PM_{2.5} Plan, p. 3-20) of SJV concerns over the level of speciation detail in the default EPA method and is not a statement about the adequacy of fugitive dust controls. Areas that do not have substantial fugitive dust, primary carbon, and metal components in their PM_{2.5} measurements, and therefore do not rely heavily on controls of these elements have little need to distinguish certain of the PM_{2.5} components. The Plan statement basically says that the default EPA approach lumps these together as "other," whereas SJV wanted the ability to distinguish them to adequately account for the affect of controls on each component. It is acceptable to use a finer level of speciation detail than listed in the EPA Guidance⁵⁷: the central idea of SMAT is that each chemical species behaves differently and is affected differently by controls, so they should be individually handled before summing them to get a total predicted concentration for comparison to the NAAQS.

EPA, the District, and CARB could have been clearer about the distinction between SMAT and SANDWICH (sulfate, addjusted nitrate, derived water, inferred carbonaceous material balance approach). Some statements about SMAT are actually about SANDWICH, which can be used as a particular step within SMAT. SMAT is the overall approach to accounting for PM_{2.5} species components in the attainment demonstration, whereas SANDWICH is a method for determining the species components of PM_{2.5} monitored concentrations, given the limitations of available measurements. The Plan's rationale for a variant on SMAT comprises a variant on SANDWICH as well. This variant is primarily to address the shortcomings of SANDWICH in

⁵⁷ "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for the 8-Hour Ozone and PM_{2.5} NAAQS and Regional Haze," EPA-454/B-07-002, April 2007, p.56.

dealing with the ammonium ion in the SJV, which is ammonia-rich and has more ammonium nitrate than ammonium sulfate, unlike most areas of the country. These issues are addressed in the Plan Appendix G, the CARB modeling supplement,⁵⁸ and the EPA 2011 Proposal TSD (p.40). EPA did not rely on any claims about the adequacy of fugitive dust controls in determining that the Plan attainment demonstration's approach to SMAT and SANDWICH is acceptable.

Comment: Earthjustice comments that a simple screening analysis cannot substitute for an unmonitored area analysis, as it is inadequate to address the sharp ambient concentration gradients that occur in near-highway areas.

Response: EPA agrees that the simple screening analysis in the Plan as originally submitted in 2008 is not an adequate substitute for an unmonitored area analysis (UAA) and note the Plan's deficiency with respect to the UAA in our November 2010 proposal. See 75 FR 74518, 74530. As noted in the 2011 proposal (76 FR 41388, 41348) and 2011 Proposal TSD (pp.42-43), however, CARB subsequently submitted a modeling supplement that included a UAA consistent with EPA Guidance. See CARB modeling supplement, p. 139. The UAA support the conclusion that there would not be any NAAQS violations at locations away from monitors, and EPA has evaluated and accepted that conclusion.

As for whether the UAA itself adequately addresses the commenter's underlying concern about sharp concentration gradients, the EPA Guidance states:

"The unmonitored area analysis is intended to be the primary means for identifying high PM_{2.5} concentrations outside of traditionally monitored locations. ... Based on the monitoring guidance, we believe that an unmonitored area analysis conducted at 12 km or finer resolution is sufficient to address unmonitored PM_{2.5} for the annual NAAQS. Conducting the unmonitored analysis at 4 km or finer resolution will provide an even more detailed analysis of the spatial gradients of primary PM_{2.5}, especially when evaluating violations of the 24-hr. NAAQS."

These modeling guidance recommendations are consistent with the requirements of the EPA's PM_{2.5} monitoring rules. The modeling guidance UAA spatial scale recommendations are intended to capture neighborhood scale and larger areas, since the monitoring rules do not require micro or middle scale monitors for either the annual or 24-hr PM_{2.5} standards. CARB's UAA was conducted at a resolution of 4 km, so it is more detailed than EPA's recommended approach for UAA. In addition, it is intended for areas with a large primary PM_{2.5} contribution (that is, directly emitted rather than formed chemically over time), and relying on local primary PM controls to reach attainment. EPA Guidance, p.100. By contrast, the attainment demonstration in the 2008 PM_{2.5} Plan mainly relies on area-wide control of NO_x, a PM_{2.5} precursor, rather than on control of local primary PM_{2.5}.

⁵⁸ CARB modeling supplement, "Three-Dimensional Grid-Based Photochemical Modeling-Related Responses to the US EPA's Technical Support Document", California Air Resources Board, January 28, 2011, p.100 (SJV_Modeling_Information_1-28-2011.pdf).

Comment: Mr. Frantz comments that the SJV District has misrepresented the winter of 2008-2009 as the cleanest on record and has made questionable claims of air quality progress, whereas in reality PM_{2.5} has worsened in recent years, except for improvement in 2009-2010. Mr. Frantz, therefore, urges EPA to independently analyze the data instead of relying on District claims. Earthjustice similarly comments that air quality worsened after 2005 despite the economic downturn, so that new modeling should be performed to account for upward trend.

Response: EPA did review the evaluation of air quality progress presented in the Plan and also independently examined air quality data. See 2011 Proposal TSD, p.6 and p.45. Air quality monitoring data is useful for a general understanding of the SJV's air quality problem, as well as for use in supplemental analyses that accompany the modeled attainment demonstration. Downward trending emissions and ambient concentrations would tend to support the conclusion that the area is on track toward attainment of the NAAQS, although evaluation of such trends should account for the particular location, time period, and air quality metric examined. In addition, overall trends may be hard to discern given the year-to-year variability of meteorology and other factors.

The Plan relies on data that was available at the time it was developed, focusing on 2001-2006, for which the Plan's Weight of Evidence analysis makes a strong case for air quality progress according to several metrics, including design value concentrations, frequency of high concentrations, concentration of PM_{2.5} component species, and emissions. We conclude that these analyses adequately support the attainment demonstration. EPA also looked at a longer period, 2000-2010, and found that the slight PM_{2.5} concentration increase shown in the Plan for 2006 continued through 2008 and flattened in 2009. Although PM_{2.5} concentrations continued to improve in 2010, the Bakersfield area's annual and 24-hour PM_{2.5} design values calculated from 2008-2010 data were the highest in the U.S. See 76 FR 41338, 41339. We note, however, that data over the longer time frame shows there has been substantial air quality progress over the past decade. See TSD, section I.B.1.

The concentration increases during 2006-2009 are not well understood, but they may have been partly a result of unfavorable meteorology during that time. District and CARB efforts to evaluate the effect of meteorology on air quality trends are under way. The higher values during that period do weaken the case made in the Plan's Weight of Evidence analysis which is a supplemental analysis to the attainment demonstration itself, but are not themselves grounds for disapproving the attainment demonstration or the Plan.

Comment: Citing 40 CFR § 51.1000 and 72 FR 20586, 20600, Earthjustice asserts that attainment of the PM_{2.5} NAAQS by April 5, 2015 will require review of ambient data from 2012, 2013, and 2014. Earthjustice also asserts that the majority of emissions reductions in the Plan are delayed until 2014 and argues that modeling ambient concentration in 2014 does not provide an accurate picture of what emissions will be in 2012 and 2013. It further states that the modeling year must be adjusted to give a more reasonable prediction of what a 3-year average concentration from 2012-2014 will be since it is this concentration that will determine if the Valley has attained the PM_{2.5} standards by the attainment date. Finally, Earthjustice asserts that the fact that the majority of reductions are in 2014 violates the reasonable further progress requirement.

Response: We disagree with Earthjustice's assertion that the Plan delays the majority of emission reductions until 2014 and therefore fails to satisfy RFP requirements. As explained in

our amended proposal (76 FR 41338, 41355-41357) and further in section II.H. of this TSD, the majority of the reductions needed for attainment occur well before 2014. The Plan's RFP demonstration shows that more than 87 percent of the NO_x, 80 percent of the PM_{2.5} and all the SO_x reductions needed for attainment will occur by 2012. *See* 2011 Progress Report, Appendix C, p. 1. We explain further in section II.H. of this TSD our reasons for concluding that the 2008 PM_{2.5} provides for RFP consistent with the CAA and the PM_{2.5} implementation rule.⁵⁹ We also explain in section III.E. our reasons for concluding that the Plan demonstrates that all control measures needed for attainment of the 1997 PM_{2.5} standards will be in place as expeditiously as practicable and no later than the beginning of 2014, consistent with the CAA and 40 CFR § 51.1007(b) (requiring "implementation of all control measures needed for attainment as expeditiously as practicable, but no later than the beginning of the year prior to the attainment date"). *See* section II.G. and II.D. of this TSD.

We also concluded that the attainment demonstration in the Plan was developed consistent with procedures in EPA's modeling guidance. In addition, to a degree the modeling procedures already reflect the expected continuing emission decreases during the years before the attainment year. The monitored base year design value reflects an emissions decrease over the three years of 2004-2006, not just the single 2005 emission year. The projected design value reflects a modeled change to that monitored design value, so it too is consistent with some decreases occurring over multiple years, not just the single year of 2014.

Finally, we note that Earthjustice conflates the requirements governing EPA's action on an attainment demonstration under CAA section 172(c)(1) with those governing an attainment determination under CAA section 179(c). Earthjustice appears to assume that a demonstration of attainment by April 5, 2015, requires a demonstration that the area will have air quality measurements at or below the levels of the standards three years prior to that date. This is incorrect. An attainment determination under CAA 179(c) is a fact-based determination made after the attainment date based on air quality monitoring data.⁶⁰ An attainment demonstration, on the other hand, is a predictive tool for assessing what air quality will be at a future time. An attainment demonstration is based on air quality modeling showing that the projected design value of the relevant pollutant in attainment year will be at or below the level of the relevant ambient air quality standard. *See* 72 FR 20586, 20605 to 20609.

Additionally, for a PM_{2.5} nonattainment area subject only to the requirements of subpart 1 of title I, part D of the CAA, a State may demonstrate that in the attainment year, the area will have air quality such that the area could be eligible for the first of two one-year extensions allowed under CAA section 172(a)(2)(C). Under CAA section 172(a)(2)(C), an area that does not have three years of monitored data demonstrating attainment of the PM_{2.5} NAAQS but has complied with all requirements and commitments pertaining to the area in the applicable SIP, and that has no more than minimal number of exceedances of the NAAQS in the attainment year, may receive a one-year extension of its attainment date. If the same conditions are met in the

⁵⁹ Clean Air Fine Particulate Implementation Rule, 72 FR 20586 (April 25, 2007), codified at 40 CFR part 51, subpart Z "PM_{2.5} implementation rule."

⁶⁰ A determination of attainment of the 1997 annual PM_{2.5} standard is based on monitoring data that shows a 3-year average of annual mean PM_{2.5} concentrations of less than 15 µ/m³, and a determination of the attainment of the 1997 24-hour PM_{2.5} standard is based on monitoring data that shows the 3-year average of 98th percentile 24-hour concentrations is less than 65 µ/m³. *See* 40 CFR § 50.7.

following year, the area may receive an additional one-year extension. Should the SJV area qualify for both of these extensions, the relevant 3-year period for determining whether the area has attained the PM_{2.5} NAAQS would be 2014-2016.⁶¹

Comment: Earthjustice and AIR comment that CARB's emission inventory update necessitates new attainment demonstration modeling. AIR alleges that EPA's 2011 Proposal TSD stated that updates should trigger new modeling. AIR notes EPA's statement in that TSD that the model underpredicts. In addition, AIR questions EPA's reliance on unreviewed model sensitivity results from CARB as the basis for not requiring new modeling. Earthjustice comments that the difficulty of performing new modeling is not a valid reason for approving an erroneous attainment demonstration. It adds that EPA's method for assessing the effect of the inventory update has the "obvious flaw" that it relies on design value changes to within hundredths of a percent, starting from design values that are, according to Earthjustice, acknowledged to be erroneous.

Response: While some large emission inventory changes might indeed necessitate new modeling, EPA does not agree that the inventory changes were large enough to substantially affect the SJV modeling conclusions, or to invalidate the SJV attainment demonstration. As EPA stated in the 2011 Proposal TSD (p. 47) ideally new modeling would be performed when an area's emissions inventory is changed. However, since the cost in time and resources of remodeling and consequent reworking of a plan is not trivial, administrative necessity requires a judgment call about when changes are large enough to merit new modeling; there is no automatic trigger. An important criterion in making this judgment is whether the changes would affect the conclusion that the plan's emission reductions are adequate for attaining the NAAQS. Another consideration is the uncertainty inherent in modeling; although model results may be reported to several decimal places, model performance goals for fractional bias are typically in the range of 30 percent. Plan's Regional Model Performance Analysis, p.12,⁶² and EPA Guidance Appendix B.⁶³ Small changes in the emission inventory are likely to have small impact on future year design values. This is not to discount the importance of an accurate emission inventory, but rather to make the point that relatively small changes in inventory estimates do not necessarily invalidate a model application. EPA finds that the 5-6 percent base year emission decreases due to the inventory updates are relatively small compared to the overall 50 percent reduction in emissions between the base and future years.

EPA did assess the effect of the emissions inventory improvements on the attainment demonstration, using a procedure described in the 2011 Proposal TSD and other supporting documents. EPA noted in the 2011 Proposal TSD (p.48) that the emissions update revealed some model bias. The model appears to be underpredicting (biased low): its emission inputs are now known to be too high, so its predicted concentrations should have been higher, too. Model bias is

⁶¹ EPA has long interpreted analogous provisions for ozone nonattainment areas in CAA sections 181(a)(5) and 182(c)(2) in this same manner. *See* Brief of Respondents, EPA, in *Sierra Club, et al. v. U.S. EPA, et al.*, Case Nos. 10-71457 and 10-71458 (consolidated), May 5, 2011; *see also Environmental Defense v. U.S. EPA*, 369 F.3d 193 (2nd Cir. 2004) (denying petition for review of EPA's approval of New York's 1-hour ozone attainment plan based on, *inter alia*, EPA's reasonable interpretation of the extension provision in CAA section 181(a)(5)).

⁶² The "Regional Model Performance Analysis" is an Appendix to the 2008 PM_{2.5} Plan.

⁶³ "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze", EPA-454/B-07-002, April 2007. ("EPA Guidance")

an important issue that modelers address in developing the model application for a specific area and pollution episode, through testing and refinement of a model's many inputs. The bias problem is somewhat ameliorated by the use of models in a relative sense via "relative response factors" (RRFs), as recommended in EPA Guidance (p. 20). The various influences that lead to model underestimation in the base year also would also be expected to cause underestimation in the attainment year, and these tend to cancel out in the RRF ratio calculation used to project the future effect of controls. In other words, the effect of model bias is minimized when it is accounted for at both end points, the base and attainment years. In a similar vein, EPA assessed the effect of the emissions update on the attainment demonstration, essentially by removing the bias revealed by the update from both the base year and the attainment year.⁶⁴ The bias was estimated by combining the emissions changes with an estimate of model PM_{2.5} sensitivity per unit of emissions change. The effect of removing the bias by this procedure was to increase predicted attainment year annual PM_{2.5} design values by 1-2 percent. EPA finds that this is small compared to the overall 22 percent change in design values from the base year to the future year due to emission controls, and that it does not change the overall modeling conclusions. But even with this increase added in, the predicted concentrations meet the NAAQS. This is a quantitative showing that the emission updates are small enough that they do not invalidate the attainment demonstration.

As described in the 2011 Proposal TSD (section II.B), EPA reviewed the development of the model application, the procedures used to develop the model inputs, model testing methods and performance statistics, and the methods used to compute RRFs and attainment year PM_{2.5} design values. EPA finds that CARB applied these methods appropriately, including to the sensitivity results and believes that these modeling inputs and RRF calculations were carried out as described by CARB. As a result, we find that the sensitivity results provide a reasonable basis for assessing the effect of the inventory update on the attainment demonstration.

EPA does not agree with Earthjustice that starting from the Plan's modeled design values and ending with small design value changes constitute flaws in the procedure for estimating the effect of the baseline inventory revisions. All modeling has uncertainty and bias, including any new modeling that would be done using the updated emission inventory estimates. Administrative necessity, therefore, requires a judgment call about whether such problems are substantial enough to compromise regulatory decisions. Air quality modeling experts from regulatory agencies, academia, and consulting firms were involved in developing the SJV modeling. It underwent successful diagnostic testing, and it performs well. EPA finds that it continues to constitute an adequate basis for the attainment demonstration.

Further, EPA believes that the original modeling is basically sound in how it portrays SJV atmospheric chemistry and transport, and that results derived from model sensitivity tests are a reasonable approximation to what would result from new modeling with the updated inventory. EPA's procedure for estimating the effect of the inventory changes using model sensitivity results does make a number of assumptions: emission changes are small enough that the model response is linear, model sensitivity is similar in the starting and ending years, and the

⁶⁴ This procedure is in some ways parallel to but is not the same as the RRF calculation and could be applied even if the model were not used in a relative sense. The inventory estimates the emissions reduction between the base and future years. An RRF scales the monitored design value using the relative model response to a given emissions reduction estimate, in order to account for that reduction. The procedure here scales the model's future predictions using model sensitivity, in order to account for changes in the emission reduction estimate.

spatial and temporal distribution of emissions is little changed with the inventory update. EPA finds that these assumptions are reasonable and that the procedure it used provides strong evidence for the attainment demonstration's validity.

As for the smallness of the design value changes resulting from the procedure, EPA does not believe this is a substantive issue. Any procedure (even new modeling) that starts with small emission changes will necessarily result in small design value changes: within a small range, over which the chemistry does not shift fundamentally, ambient concentrations are approximately proportional to emissions. This is not a case of an overly precise tiny number being added to a large erroneous random number, but rather of an adjustment ratio applied to a number derived from extensive data and analysis. Some intermediate steps in the calculation procedure that EPA used to evaluate the emissions inventory change did involve tenths of a percent (not hundredths as stated by the commenter), but this is largely an artifact of showing the procedure in multiple steps for comprehensibility. EPA could have done the calculation in a single step to avoid this artifact. When a 10 percent change in NO_x emission results in a design value change of 1.4 percent, a calculation using this model sensitivity result will necessarily involve fractions of 1 percent or less. In this case, the emissions inventory update involved a change in NO_x emissions of less than 10 percent, and thus, would be expected to also yield relatively small design value changes.

Comment: The District comments that they support the additional documentation for air quality modeling and for showing that VOC is not a precursor has been provided to EPA by CARB. The District believes the documentation is sufficient to allow EPA to approve the modeling and reverse its proposal to include VOC as a precursor.

Response: In our July 2011 proposal, we evaluated the additional documentation for air quality modeling and proposed to approve the air quality modeling. We also evaluated the additional documentation related to whether VOC should be a precursor and proposed to find that VOC is not a precursor. We are finalizing these proposals today.

Comment: Earthjustice comments that given these problems, the 9:1 NO_x to PM_{2.5} relative effectiveness ratio cannot be used for transportation conformity or other purposes, unless it is supported with new modeling.

Response: EPA does not agree with Earthjustice that the modeling problems are substantial enough to invalidate the 9:1 ratio for NO_x to direct PM_{2.5} emission trading in the transportation conformity context. As discussed above, EPA believes that the modeling is basically sound, including the model's (relative) sensitivity to emission changes. There is no established method for determining trading ratios in conformity, but as discussed in the 2011 Proposal TSD (p.148), EPA finds that the model sensitivity-based method used by CARB for determining an equivalency or relative effectiveness ratio is adequate for assessing the effect of area-wide emissions changes, such as are used in conformity budgets. The method modeled "across the board" emission changes over the entire modeling domain; emissions considered in transportation conformity are also domain-wide. Trading in other contexts could involve additional consideration of spatial and temporal variation of the emissions, and would require an additional technical demonstration by the State and evaluation by EPA. EPA is not approving the trading ratio for any other purpose than in conformity budgets.

D. PM_{2.5} Attainment Plan Precursors

Comment: Earthjustice comments that EPA should rely on the November 2010 proposal's technical demonstration that VOC should be considered a PM_{2.5} plan precursor and should disapprove the Plan for its failure to address control of VOC emissions. The commenter states that EPA reversed its earlier VOC finding without receiving any new credible evidence on the issue. It discussed various evidence in favor of VOC as a precursor, including statements in the Plan, the relative size of the VOC and NO_x inventories, the fraction of ambient PM_{2.5} that is organic carbon, results from modeling studies, and a statement by District staff that VOC reductions may reduce PM_{2.5} more than do reductions of SO₂, which is considered a plan precursor.

Response: The PM_{2.5} implementation rule establishes a presumption that VOC is not a PM_{2.5} plan precursor requiring controls. *See* 40 CFR § 51.1002(c)(3). This presumption may be overturned if either EPA or the state technical provides an appropriate demonstration showing that VOC emissions from sources in the state significantly contribute to PM_{2.5} concentrations in the nonattainment area. *See* 40 CFR § 51.1002(c)(3)(i) and (ii). The preamble to the implementation rule suggests various analyses that could be part of such a demonstration, such as emissions inventory, speciation data, modeling information, or other special studies. But the preamble is not prescriptive on required technical demonstrations, and neither the preamble nor the rule defines "significantly contribute". Under the rule, excluding VOC as an attainment plan precursor does not require a showing that VOC controls are ineffective or counterproductive. Rather, since VOC is already excluded by presumption, the lack of a clear showing that VOC controls are effective is sufficient for it to remain excluded.

For the November 2011 proposal, EPA reviewed various monitoring and modeling studies on the role of VOC as a PM_{2.5} precursor in the SJV. EPA proposed to find that these studies constitute a technical demonstration that VOC is a PM_{2.5} attainment plan precursor, and used that as a basis to propose disapproval of the Plan, which lacks VOC controls.

Earthjustice correctly notes that CARB did not submit any new study results *per se* in response to our 2010 proposal but rather reinterpretation of same modeling studies that EPA had already examined. For the 2011 proposal, EPA reviewed and accepted several of CARB's arguments made in its VOC supplement⁶⁵. CARB noted the importance of considering simultaneous VOC and NO_x reductions, a more realistic scenario than VOC-only or NO_x-only reductions, given the various controls that are already in place for the ozone plan. The only study to consider simultaneous reductions found a disbenefit from VOC control, while NO_x control continued to be beneficial. CARB discounted one study that had found VOC control to be beneficial by noting that it had used artificially doubled VOC emissions in order to perform reasonably well at predicting PM_{2.5}. For another study, CARB pointed out some features of the multi-day model response to VOC reductions that are inconsistent with the photochemical VOC pathway to PM_{2.5} formation and that the benefits from VOC reduction were seen only at high PM_{2.5} concentrations that are seldom seen today.

⁶⁵ Letter, James N. Goldstene, Executive Officer, CARB, to Frances Wicher, Office of Air Planning, EPA Region 9, January 28, 2011, Attachment 4, "Air Resources Board comments on U.S. EPA's November 30, 2010 proposal that VOC be considered a significant PM_{2.5} Precursor for the San Joaquin Valley 2008 PM_{2.5} State Implementation Plan (SIP)." ("CARB VOC supplement")

EPA found these arguments persuasive enough to raise question about the efficacy of VOC controls for reducing PM_{2.5} levels in the SJV. Even setting aside concern that VOC control could worsen PM_{2.5} concentrations in some circumstances, EPA finds that the evidence of the effectiveness of VOC controls is at this time not clear enough to overcome the presumption in the PM_{2.5} implementation rule that VOC should not be an attainment plan precursor. However, EPA also believes it is important that reductions of VOC, ammonia, and other PM_{2.5} precursors be more thoroughly explored with realistic model sensitivity and other analyses as part of future modeling efforts in the SJV.

EPA had not considered the SO₂ statement described by Earthjustice. However, it appears to be based on the receptor modeling performed by the District; the 1.4 µg/m³ benefit of VOC mentioned in the statement is cited in the Plan's Receptor Modeling Documentation (p.82). Both CARB and EPA consider the receptor modeling to be a supplemental analysis, whereas the CMAQ photochemical modeling is the basis for the Plan attainment demonstration and for conclusions about the effectiveness of controls. The lack of a chemical mechanism in receptor modeling calls into question its usefulness for determining the efficacy of VOC controls, since the main pathway for VOC to form PM_{2.5} is via photochemical reactions with NO_x. Unfortunately, all of this is somewhat ambiguous in the Plan because in places the Receptor Modeling Documentation also mentions CMAQ photochemical modeling as a partial basis for its conclusions.

Earthjustice also argues that if VOC control is more effective than SO₂ control, and SO₂ is a plan precursor, then VOC should also be a plan precursor. This argument has some intuitive appeal. However, as discussed above, EPA's PM_{2.5} implementation rule establishes a presumption that VOC is not a PM_{2.5} attainment plan precursor absent an appropriate technical demonstration for the specific nonattainment area. Regulation of SO₂ as a PM_{2.5} attainment plan precursor, on the other hand, is required in all PM_{2.5} nonattainment areas. *See* 40 CFR § 51.1002(c)(1). Thus, EPA cannot rely on an argument about the relative effectiveness of VOC and SO₂ control to establish VOC as an attainment plan precursor. To the extent that Earthjustice intended to challenge EPA's determinations regarding PM_{2.5} plan precursors in the PM_{2.5} implementation rule, that challenge is outside the scope of this action.

Even if it were known that controlling VOC would be more effective than controlling SO₂, that would not in itself imply VOC should be an attainment plan precursor unless SO₂ control had also been demonstrated to be effective. There has not been such a demonstration for the SJV; SO₂ is an attainment plan precursor by presumption, not because controlling it has been shown to be effective in this area. Indeed, the 2008 PM_{2.5} Plan includes a statement that SO₂ control is not effective (Receptor Modeling Documentation, p.81⁶⁶), despite the District statement quoted by the commenter. Given these conflicting statements, the SO₂ premise of the commenter's argument has not been established, even if the argument was admissible.

EPA addressed all other arguments submitted by Earthjustice in both our 2010 proposal and 2011 proposal. *See* 2010 Proposal TSD pp.50-60,⁶⁷ 2011 Proposal TSD pp.52-66). The main arguments are briefly summarized here. The Plan itself is somewhat contradictory on the VOC

⁶⁶ The "Receptor Modeling Documentation" is an appendix to the 2008 PM_{2.5} Plan.

⁶⁷ The 2010 Proposal TSD is the "Draft Technical Support Document for the Revised Proposed Action on the San Joaquin Valley 2008 PM_{2.5} Plan and the San Joaquin Valley Portions of the Revised 2007 State Strategy," Air Division, U.S. EPA, Region 9, November 8, 2010.

issue, with some explicit rejections of VOC as a plan precursor, but also some generic statements on VOC as a possible precursor under some conditions; in its Receptor Modeling Documentation there is an outright statement that VOC control is effective, while in its response to public comments there are several statements dismissing VOC as a precursor (Comments and Responses, 2008 PM_{2.5} Plan Appendix J). In our 2011 proposal, EPA emphasized the inconclusiveness of these multiple statements, and also to the fact that the receptor modeling is considered by CARB and EPA to be a supplemental analysis, and not the basis for the attainment demonstration.

The monitoring studies were not conclusive as to the efficacy of VOC controls, but in our 2011 proposal EPA gave more emphasis to statements in one study⁶⁸ that highlighted aerosol nitrate formed aloft at night, a PM_{2.5} formation pathway that may not be driven by local VOC emissions, and hence little affected by VOC controls. The imported ozone pathway was also described as the dominant in one of the modeling studies, as well as by CARB staff involved in modeling of the California Regional Particulate Air Quality Study (CRPAQS) episodes.

The modeling studies gave mixed results, with one finding no benefit from VOC controls, another finding a PM_{2.5} disbenefit from VOC reductions when they occur simultaneously with NO_x reductions, and several finding VOC control to be effective, at least at certain times and places. In our 2010 proposal, EPA emphasized aspects of the later studies that generally found VOC controls to be effective, but did not give sufficient weight to aspects that showed little effectiveness, or to an earlier study that showed VOC controls could be counterproductive. Based on CARB's supplemental submittals, however, we have concluded the technical information is not conclusive enough at this time to overcome the presumption against regulation of VOC as a plan precursor in the SJV area for purposes of the 1997 PM_{2.5} standards.

We note as a practical matter, that substantial VOC reductions have already occurred and will occur in the future as a result of SJV's ozone plans, so whether or not these VOC controls are part of the PM_{2.5} Plan will not negatively affect air quality. If there are air quality benefits from the VOC controls, they will be realized either way.

Comment: Mr. Frantz also questions why there has been little air quality progress in Bakersfield in comparison to other locations, and suggests that ammonia from factory dairies, together with relatively high NO_x emissions from the oil industry, may be the cause of increased ammonium nitrate concentrations. He thus urges that EPA reconsider accepting the exclusion of ammonia as a PM_{2.5} plan precursor.

Response: Under the PM_{2.5} implementation rule, like VOC, ammonia is not a PM_{2.5} plan precursor unless either EPA or the State provides an appropriate technical demonstration showing that ammonia emissions from sources in the State significantly contribute to PM_{2.5} concentrations in the nonattainment area. See 40 CFR § 51.1002(c)(4). The causes of Bakersfield's relatively poor progress are not fully understood. Its location at the southern end of the SJV, with more restricted airflow and a greater chance of stagnant conditions and long-lasting early morning radiation inversions, is a factor in its poor air quality. Two additional projects under way for the SJV are "Review, Develop, and Evaluate Improved Approaches for

⁶⁸ Lurmann, F.W., Brown, S.G., McCarthy, M.C., and Roberts P.T., 2006, "Processes Influencing Secondary Aerosol Formation in the San Joaquin Valley During Winter", Journal of the Air & Waste Management Association, 56: 1679-1693.

Corroborative & Weight-of-Evidence Analyses” and “Develop Improvements to the PM_{2.5} Inventory to Better Reconcile with Ambient Measurements”. These are being conducted under the auspices of the Central California Air Quality Studies (CCAQS) Technical Committee. The latter will include improvements for estimates of the ammonia from livestock and also will include a task to “Investigate Specific High PM_{2.5} Areas in the CCAQS Domain,” particularly Bakersfield. These projects will add to the understanding of the recent trends in Bakersfield, and could indicate analysis improvements or potential controls to aid in air quality progress. For more information on these studies, *see* CARB’s Central California Air Quality Studies web site (<http://www.arb.ca.gov/airways/>) and SJV’s “Request for Proposals” web page (<http://www.valleyair.org/RFPs/RFP.htm>).

To address the specific question posed by Mr. Frantz, if ammonia and NO_x were both enhanced in Kern County relative to other locations, as suggested by the commenter, that would not in itself change the PM_{2.5} formation from being NO_x-limited to ammonia-limited. As discussed in the 2011 Proposal TSD (p.45 and pp.52-53), the Plan provided ample evidence that ammonia is so abundant that controlling it would be ineffective for addressing PM_{2.5}. That evidence included the relative unresponsiveness of the receptor and photochemical models to ammonia reductions, CRPAQS studies of the relative abundance of NO_x and ammonia, correlation between NO_x and ammonium nitrate concentrations, and plots of ammonia against nitric acid showing the former’s much larger concentration. Another point noted in the 2011 Proposal TSD (p.55) is the relative spatial homogeneity of nitrate found in one CRPAQS study quoted in the Plan, thought to be caused by entrainment of aerosol nitrate formed aloft and then transported throughout the area, as opposed to being caused by especially high localized emissions. Since there has been no technical demonstration to reverse the PM_{2.5} implementation rule presumption that ammonia should not be considered a PM_{2.5} plan precursor, and there is evidence that ammonia control would not be effective, we conclude that we do not currently have a basis for reversing the presumption against regulation of ammonia as a plan precursor in the SJV area for purposes of the 1997 PM_{2.5} standards EPA agrees, however, that continued exploration of the precursor issue in SJV is warranted.

Comment: The District comments that they support the additional documentation for showing that VOC is not a precursor has been provided to EPA by CARB. The District believes the documentation is sufficient to allow EPA to reverse its proposal to include VOC as a precursor.

Response: In our July 2011 amended proposal, we evaluated the additional documentation related to whether VOC should be a precursor and proposed to find that VOC is not a precursor. We are finalizing this proposal today.

Comment: Mr. Unger commented that he supported recognizing the role of NO_x, SO_x and VOC in the formation of particulate pollution.

Response: EPA’s PM_{2.5} implementation rule requires PM_{2.5} plans to include controls for NO_x and SO_x sources but does not require them to include controls for VOC sources unless there is a sufficient demonstration that such controls would significantly reduce PM_{2.5} levels. *See* 72 FR 20586, 20589. After a review of the available scientific literature on the role of VOC on the formation of PM_{2.5} in the SJV, EPA has determined that there is insufficient information at this time to reverse the presumption against regulation of VOC controls in the 2008 PM_{2.5} plan. *See* 76 FR 41338, 41350-41353 and section II.C. of this TSD. We note that, as an ozone

nonattainment area, the SJV is required to control VOC and already has in place numerous VOC control measures.

E. Reasonably Available Control Measures

Comment: Earthjustice asserts that EPA must disapprove the Plan's RACM/RACT demonstration because many of the rules that the District and CARB rely on have not been approved as satisfying RACT requirements. Earthjustice also states that the demonstration fails to address VOC controls or to provide adequate air quality modeling documentation. Finally, Earthjustice asserts that several of the rules intended to provide the majority of NO_x and PM reductions from stationary sources in the Valley were adopted with substantially weakened controls from what was anticipated during plan development and will now provide only a fraction of what is needed to bring the area into attainment by 2014.

Response: Section 172(c)(1) of the CAA requires that each attainment plan "provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology), and shall provide for attainment of the national primary ambient air quality standards." For over 30 years, EPA has consistently interpreted this provision to require that States adopt only those "reasonably available" measures necessary for expeditious attainment and to meet RFP requirements. 40 CFR § 51.1010; *see also* 44 FR 20372 (April 4, 1979) (Part D of title I of the CAA "does not require that all sources apply RACM if less than all RACM will suffice for [RFP] and attainment"); 57 FR 13498, 13560 (April 16, 1992) ("where measures that might in fact be available for implementation in the nonattainment area could not be implemented on a schedule that would advance the date for attainment in the area, EPA would not consider it reasonable to require implementation of such measures"); "Guidance on the Reasonably Available Control Measures (RACM) Requirement and Attainment Demonstration Submissions for Ozone Nonattainment Areas," November 30, 1999 (1999 Seitz Memo) (a State may justify rejection of a measure as not "reasonably available" for that area based on technological or economic grounds); and 70 FR 71612, 71661 (November 29, 2005) (noting that States "need adopt measures only if they are both economically and technologically feasible and will advance the attainment date or are necessary for RFP"). EPA's interpretation of section 172(c)(1) has been upheld by several courts. *See, e.g., Sierra Club v. EPA, et al.*, 294 F.3d 155 (D.C. Cir. 2002); *Sierra Club v. EPA*, 314 F.3d 735 (5th Cir. 2002).

Under the PM_{2.5} implementation rule at 40 CFR § 51.1010, a RACM demonstration must include "the list of the potential measures considered by the State, and information and analysis sufficient to support the State's judgment that it has adopted all RACM, including RACT." 40 CFR § 51.1010(a). In addition, "[p]otential measures that are reasonably available considering technical and economic feasibility must be adopted as RACM if, considered collectively, they would advance the attainment date by one year or more." As explained in the preamble to the PM_{2.5} implementation rule, Congress provided EPA and States broad discretion to determine what measures to include in an attainment plan, and the language in section 172(c)(1) requiring only "reasonably available" measures and implementation of these measures "as expeditiously as practicable" indicates that Congress intended for the RACT/RACM requirement to be driven by an overall requirement that the measure be "reasonable." 72 FR 20586, 20610 (April 25, 2007).

Thus, the rule of “reason” drives the decisions on what controls to apply, what should be controlled, by when emissions must be reduced, and finally, the rigor required in a State’s RACT/RACM analysis. *See id.* States may, as part of a RACM analysis, consider the costs of potential control measures and whether the measures can be readily and effectively implemented without undue administrative burden. *See id.* (citing 55 FR 38327 and 66 FR 26969).

As a threshold matter, we note that VOC controls are not a required element of the RACM demonstration in the 2008 PM_{2.5} Plan because EPA agrees with the State’s determination that VOC are not attainment plan precursors for purposes of the 1997 PM_{2.5} NAAQS in the SJV area. *See* 76 FR 41338, 41343 (citing 40 CFR § 51.1002(c) and § 51.1010) and our responses to comments on attainment plan precursors, in section III.D. above.

Second, as to air quality modeling documentation, we explain in section III.C. above in our responses to comments on the air quality modeling our reasons for concluding that the modeling in the 2008 PM_{2.5} Plan adequately supports the Plan’s RACM and attainment demonstration.

Third, as to Earthjustice’s assertions about RACT, we note that although CAA section 182(b)(2) requires States to implement RACT for specific types of sources in ozone nonattainment areas classified as moderate or above, there is no specific RACT control mandate for PM_{2.5} purposes that applies to specific sources in PM_{2.5} nonattainment areas. Rather, under the PM_{2.5} implementation rule, RACT and RACM are those measures that a state finds are both reasonably available and contribute to attainment as expeditiously as practicable in the specific nonattainment area. *See* 76 FR 41338, 41343 (citing 40 CFR § 51.1010 and 72 FR 20586, 20612). EPA has, therefore, evaluated the collection of reasonably available control measures that CARB and the District have adopted and submitted with the attainment demonstration in the 2008 PM_{2.5} Plan to meet the RACM/RACT requirement in CAA section 172(c)(1) and 40 CFR § 51.1010. *See* 76 FR 41338, 41343-41346 and 2011 Proposal TSD at section II.D.

Finally, as to the specific NO_x and PM control options that Earthjustice asserts should also be required as RACM, we have considered whether these additional control options are reasonably available for implementation in SJV considering technical and economic feasibility, and as to those measures that are potentially reasonable, whether they would be considered collectively advance the attainment date in the SJV by one year or more. For the reasons discussed below, we conclude that the control options identified by Earthjustice are not required RACM for purposes of the 1997 PM_{2.5} NAAQS in the SJV area.

Comment: Earthjustice states that EPA should not approve Rule 4692 (Commercial Charbroiling) as RACT because there is no justification for the District’s decision to exclude control requirements for under-fired charbroilers (UFC) from the rule. In support of this assertion, Earthjustice states, among other things, that: (1) SJVUAPCD had initially found certain control options for UFC units to be cost-effective and that its later revisions to these cost estimates in response to comments were based on inappropriate criteria, such as its “10 percent of the industry’s profits” test; (2) that BAAQMD’s adoption of UFC control requirements in 2007 indicates that such controls are considered feasible; and (3) that SJVUAPCD’s failure to control UFCs means that PM emission reductions from this rule are reduced from more than 2 tons per day (tpd) to just 0.02 tpd.

Response: EPA recently determined that Rule 4692 satisfied applicable CAA requirements and fully approved the rule into the SJV portion of the California SIP.⁶⁹ See 76 FR 38340 (June 30, 2011) (proposed rule) and “Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District” final rule, pre-publication notice signed September 30, 2011 (Rule 4692). As part of that action, EPA reviewed the District’s evaluation of potential UFC controls and concurred with the District’s conclusion that those controls are not reasonably available for implementation in the SJV area at this time, considering technological and economic feasibility (See EPA’s June 9, 2011 TSD at pp. 4-5). Given EPA’s long-standing position that States may justify rejection of certain control measures as not “reasonably available” based on economic grounds (among others), we believe that it is appropriate for the District to consider the cost of controls at sources actually located within the specific area to determine if they are economically feasible with respect to those sources. Although we do not endorse the District’s use of a “10 percent of the industry’s profit” test for economic feasibility, we agree with the District’s conclusion that UFC controls are not economically feasible based on the facts and circumstances related to actual cost of those controls in the SJV area. For the reasons stated in our separate proposed and final rules on Rule 4692, we conclude in this final action on the 2008 PM_{2.5} Plan that Rule 4692 requires all RACM for charbroilers in SJV, and that the additional controls for UFC identified by Earthjustice are not required RACM for purposes of the 2008 PM_{2.5} Plan because they are not reasonably available considering technological and economic feasibility.

Comment: Earthjustice asserts that Rule 4103 (Open Burning) achieves far less than what was anticipated in the Plan, and that the District had inappropriately relied on the ten percent of profits test to exempt from control the three largest source categories of NO_x, PM, and VOC covered by the Rule. Earthjustice asserts that this resulted in foregone emission reductions of 1,030 tpy NO_x, 1,262 tpy PM_{2.5} and 1,138 tpy VOC.

Response: EPA recently determined that Rule 4103 satisfied applicable CAA requirements and fully approved the rule into the SJV portion of the California SIP. See 76 FR 40660 (July 11, 2011) (proposed rule) and “Revisions to the California State Implementation Plan, San Joaquin Valley Unified Air Pollution Control District,” final rule, pre-publication notice signed September 30, 2011 (Rule 4103)). As part of that action, EPA reviewed the District’s evaluation of the postponements of certain burning prohibitions for certain agricultural crop categories and concurred with the District’s conclusion that alternatives to open burning for these crop categories are not reasonably available for implementation in the SJV area at this time, considering technological and economic feasibility (See, e.g., EPA’s June 2011 TSD at pp. 5-7). For the reasons stated in those separate proposed and final rules concerning Rule 4103, we conclude in this final action on the 2008 PM_{2.5} Plan that Rule 4103 requires all RACM for open burning in SJV, and that the additional controls identified by Earthjustice are not required RACM for purposes of the 2008 PM_{2.5} Plan because they are not reasonably available considering technological and economic feasibility.

⁶⁹ As explained in our June 30, 2011 proposal to approve Rule 4692 (76 FR 38340), the specific ozone RACT requirement in CAA section 182(b)(2) does not apply to this rule because there are no Control Techniques Guideline (CTG) documents for this source category and no major sources of NO_x or VOC subject to this rule in the SJV area. See 76 FR 38340, 38341. We therefore interpret the commenters’ reference to RACT as referring to the general requirement for reasonably available control measures (including RACT for stationary sources) in CAA section 172(c)(1). See 40 CFR § 51.1010.

Comment: Earthjustice stated that SJVUAPCD added a contingency provision to Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) stating that, should the Valley fail to attain the 1997 PM_{2.5} standards by the attainment date, the PM_{2.5} concentration triggering a mandatory wood burning curtailment would be lowered from 30 to 20 µg/m³. Earthjustice contends that, given the underperformance of other SJVUAPCD rules, this “contingency” should be adopted now to achieve additional reductions before the attainment date.

Response: EPA recently determined that Rule 4901 satisfied applicable CAA requirements and fully approved the rule into the SJV portion of the California SIP. *See* 74 FR 57907 (November 10, 2009). As part of that action, EPA reviewed the District’s evaluation of available controls and concluded that Rule 4901 requires implementation of Best Available Control Measures under CAA section 189(b) for particulate matter of 10 microns or less (PM-10) in the SJV area. This conclusion was based in part on our finding that SJV’s 30 µg/m³ threshold for mandatory wood burning curtailment is more stringent than the 35 µg/m³ threshold adopted in other areas such as Sacramento, South Coast and Bay Area. *See* SJVUAPCD, “Final Draft Staff Report, Proposed Amendments to Rule 4901 “Wood Burning Fireplaces and Wood Burning Heaters,” October 16, 2008, at pp. 5-6.

Earthjustice has provided no information to support an argument that reducing the threshold for mandatory wood burning curtailment in the SJV from 30 to 20 µg/m³ is a “reasonably available” control measure, nor any information to support an argument that such a measure would, individually or in combination with other reasonable measures, advance attainment of the 1997 PM_{2.5} standards in the SJV by at least a year. We have, nonetheless, evaluated in the section entitled “Evaluation of potential to advance attainment” below the additional PM emission reductions that could be achieved by implementing a mandatory wood burning curtailment at a 20 µg/m³ threshold (1.6 tons per winter average day, *see* 76 FR 41338, 41358) to determine whether this measure could, in combination with other potentially reasonable measures, advance attainment in the SJV area.

Comment: Earthjustice asserts that the exemption in Rule 4354 (Glass Melting Furnaces) for furnaces that actually emit less than 8 tons per year of NO_x or VOC (but are located at major sources) is “illegal” because the CAA requires that RACT be implemented for all major sources. Earthjustice states that this exemption cost the Valley 1.6 tons per day of SO_x reductions and 2.9 tons per day of PM reductions. Earthjustice also states that the District had adopted a previous version of Rule 4354 that had earlier compliance deadlines than the version EPA ultimately approved into the SIP. Earthjustice asserts that the District should have removed the exemption for small furnaces at large facilities and should not have delayed compliance requirements, and that “it is unacceptable for the District to forego any emission reductions in the years leading up to attainment.”

Response: EPA recently determined that Rule 4354 satisfied applicable CAA requirements and fully approved the rule into the SJV portion of the California SIP. ⁷⁰ *See* 76 FR 53640 (August

⁷⁰ As explained in our June 30, 2011 proposal to approve Rule 4692 (76 FR 38340), the specific ozone RACT requirement in CAA section 182(b)(2) does not apply to this rule because there are no Control Techniques Guideline (CTG) documents for this source category and no major sources of NO_x or VOC subject to this rule in the SJV area. *See* 76 FR 38338, 38341. We therefore interpret the commenters’ reference to RACT as referring to the general requirement for reasonably available control measures (including RACT for stationary sources) in CAA section 172(c)(1). *See* 40 CFR § 51.1010.

29, 2011). As part of that action, we determined that the VOC and NO_x emission limits in Rule 4354 meet the CAA section 182(b)(2) and (f) RACT requirements for major sources of VOC and NO_x. The compliance schedule for NO_x and VOC limits in the SIP-approved rule requires implementation of all technologically and economically feasible controls by January 2014. *See* SJVUAPCD, Final Draft Staff Report, “Proposed Amendments to Rule 4354 (Glass Melting Furnaces),” August 19, 2010, at pp. 10-12. We conclude, therefore, that this rule implements all VOC and NO_x controls that are reasonably available for this source category in the SJV. We did not fully evaluate in that action the stringency of the rule’s requirements for SO_x and PM₁₀ emissions, as there is no specific RACT control mandate for SO_x or PM₁₀ purposes that necessarily applies to sources covered by this rule.⁷¹ We disagree with Earthjustice’s assertion that the exemption from the SO_x and PM₁₀ limits for certain furnaces that actually emit less than 8 tpy of VOC or NO_x (*See* Rule 4354, section 4.3) is “illegal,” as the CAA does not establish a specific RACT control mandate for major sources of SO_x or PM₁₀. Under CAA section 172(c)(1), however, the State/District is required to adopt all RACM necessary to demonstrate attainment as expeditiously as practicable and to meet RFP requirements. 40 CFR § 51.1010. Given the need for substantial NO_x and PM_{2.5} emission reductions in the SJV to meet both the 1997 PM_{2.5} standards and the more stringent 2006 PM_{2.5} standards by the applicable attainment dates, we encourage the SJVUAPCD to reevaluate the PM₁₀ control requirements in Rule 4354 and to adopt, as expeditiously as practicable, any additional PM₁₀ and PM_{2.5} control requirements that are reasonably available for implementation in the Valley. For purposes of the 2008 PM_{2.5} Plan, additional PM control requirements for glass melting facilities may, upon SIP approval, be credited toward the District’s remaining enforceable commitments. *See* 76 FR 41338, 41354, Table 8.

Earthjustice asserts that the exemption in Rule 4354 for furnaces emitting less than 8 tpy of NO_x or VOC cost the Valley 1.6 tons per day of SO_x reductions and 2.9 tons per day of PM reductions. For purposes of the 2008 PM_{2.5} Plan, the foregone SO_x emission reductions do not affect the RACM and attainment demonstration because SJV has exceeded its target level of SO_x reductions needed for attainment. *See* 76 FR 41388, 41354, Table 8. As to PM, we have evaluated the additional emission reductions that Earthjustice claims could have been achieved from glass melting facilities⁷² in our evaluation below of the potential for such additional controls, in combination with other potential control options, to advance attainment of the 1997 PM_{2.5} standards in the SJV. *See* section “Evaluation of potential to advance attainment” below.

Comment: Earthjustice states that EPA recently rejected all of the NO_x emission limits in Rule 4352 (Solid Fuel-Fired Boilers, Steam Generators and Process Heaters) for failing to satisfy RACT and asserts that substantial NO_x reductions could be achieved if the District amended this rule to meet the stringent limits in place in other areas of the Country.

Response: Earthjustice correctly notes that EPA recently disapproved all of the NO_x emission limits in Rule 4352 based on our conclusion that the District had failed to adequately demonstrate that these limits satisfy CAA section 182 RACT requirements. *See* 75 FR 60623

⁷¹ The CAA requires implementation of RACT at any major source of NO_x or VOC in ozone nonattainment areas classified as moderate or above (*See* CAA 182(b)(2)(C) and 182(f)) but does not contain such a major source RACT control mandate for SO_x or PM purposes.

⁷² For this assessment, we use Earthjustice’s estimate of the foregone PM reductions and assume conservatively that all such PM reductions are PM_{2.5} reductions.

(October 1, 2010). Earthjustice did not provide any specific information about additional control measures that are reasonably available, nor has it provided information about the amount of emissions reductions that might be achieved by such controls. We have, however, developed a conservative (high) estimate of the additional NO_x reductions that could be achieved under this rule if the emission limits are strengthened. We developed this estimate based on the NO_x emission limits in the SIP-approved version of Rule 4352, the emissions attributed in the 2008 PM_{2.5} plan to solid fuel-fired boilers, steam generators, and process heaters in the SJV, emissions data from existing solid fuel-fired boilers in the SJV, and technical information about available control options from EPA's 1994 Alternative Control Techniques Document for NO_x Emissions from Industrial/Commercial/Institutional Boilers, US EPA 453/R-94-022 (1994 Boiler ACT). Based on this information, we have conservatively estimated that more stringent control requirements for solid fuel-fired boilers, steam generators, and process heaters in SJV could achieve an additional 3.16 tpd of NO_x reductions.⁷³

Comment: Earthjustice states that EPA's proposal fails to address the fact that the RACM/RACT analysis "does not include reasonable controls for condensable [PM_{2.5}] emissions" and contains no discussion of such controls. Earthjustice references 40 CFR § 51.1002(c) to support its assertion that "[t]he transition period allowing agencies to ignore controls on condensable emissions ended on January 1, 2011," and also quotes EPA's statement in the preamble to the

⁷³ The assumptions and calculations we used to estimate the potential additional emissions reduction from Rule 4352 are given in the table below.

	Estimated 2014 Baseline NO _x Emissions (tpd)	Estimated Potential NO _x Emission Reductions (tpd) ¹
Municipal solid waste	1.46 ²	0.29-1.29
Coal	2.30 ³	1.87
Biomass	0.4 ⁴	0.0 ⁵
Total	4.21 ⁶	2.16-3.16

Table Notes:

¹ Estimated emissions reductions for MSW-fueled and coal-fueled units are based on reasonably achievable emissions controls as listed in Table 2-6 of the ICI ACT.

² Estimated emissions based on the size of SJV's only MSW facility and the currently applicable emissions limits in Rule 4352.

³ Estimated total capacity of coal-fired boilers in SJV is 1200 MMBtu/hour. Emissions are calculated by applying the currently applicable Rule 4352 emissions limits to this capacity. We note that many SJV facilities permitted to burn coal are also permitted to burn tire-derived fuel (TDF) and petroleum coke and that there have been recent changes that allow some facilities to co-fuel with biomass. The estimated emissions do not take these alternative fuels into account.

⁴ Estimated by subtracting estimated emissions from MSW-fueled and coal-fueled units from the total 2014 solid-fuel fired boiler inventory of 4.21 tpd.

⁵ It is unclear that revising the NO_x emission limits in Rule 4352 would result in significant emissions reductions from SJV biomass facilities given that all of the existing biomass boilers are already achieving much lower NO_x emissions consistent with Best Available Control Technology permit limits. See 75 FR 60623, 60630, Response #9. Nonetheless, we note that biomass facilities have recently installed SCR as a control technology so further reductions might be reasonable achievable in the near future but very hard to quantify at this time. We, therefore, have assumed no additional emissions reductions from these facilities.

⁶ From 2008 PM_{2.5} Plan, Appendix I at p. 20.

PM_{2.5} implementation rule (72 FR at 20652) that “[w]e expect States to address the control of direct PM_{2.5} emissions, including condensables with any new actions taken after January 1, 2011.” Earthjustice asserts that EPA must disapprove the RACM demonstration for failure to assess reasonably available controls on condensable emissions.

Response: EPA’s PM_{2.5} implementation rule states that “[a]fter January 1, 2011, for purposes of establishing emissions limits under 51.1009 and 51.1010, States must establish such limits taking into consideration the condensable fraction of direct PM_{2.5} emissions.” 40 CFR § 51.1002(c). Prior to this date, the rule required that nonattainment area SIPs identify and evaluate sources of PM_{2.5} direct emissions and PM_{2.5} attainment plan precursors as part of the RFP and RACM/RACT demonstrations but did not specifically require states to address condensable PM_{2.5}. *See id.*⁷⁴ Because the attainment, RFP and RACM demonstrations in the 2008 PM_{2.5} Plan were adopted on May 22, 2008 (*see* 76 FR 41338, 41340), California was not required to address condensable PM in establishing the emissions limits contained in these demonstrations as originally submitted, or in adopting any other PM emission limits under 40 CFR sections 51.1009 and 51.1010 prior to January 1, 2011. Consistent with these requirements, EPA has evaluated the RFP and RACM demonstrations in the 2008 PM_{2.5} Plan and concluded that these elements of the Plan appropriately address all sources of direct PM_{2.5} emissions and PM_{2.5} attainment plan precursors (SO₂ and NO_x) in the SJV. *See* 76 FR 41338, 41343.⁷⁵

The 2008 PM_{2.5} Plan relies on several rules regulating direct PM_{2.5} emissions as part of the PM_{2.5} control strategy (*e.g.*, Rule 4692 (Commercial Charbroiling, adopted 9/17/09), Rule 4103 (Open Burning, adopted 4/15/10), Rule 4354 (Glass Melting Furnaces, adopted 9/16/10) and Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters, adopted 10/16/08)) as well as rules controlling NO_x and SO_x emissions. *See* 2011 Proposal TSD at Tables F-2, F-3, and F-4. Of the rules that control direct PM_{2.5} emissions, only two establish emission limits for particulate matter (Rule 4692 (Commercial Charbroiling) and Rule 4354 (Glass Melting Furnaces)). EPA has not yet acted on any District rule adopted or revised after January 1, 2011 that regulates direct PM_{2.5} emissions. As part of our action on any such rule, we will evaluate the emission limits in the rule to ensure that they appropriately address CPM, as required by 40 CFR 51.1002(c). We note that the revised version of Rule 4692 (Commercial Charbroiling) that EPA has recently proposed to approve (*see* 76 FR 38340 (June 30, 2011)) requires testing in accordance with the South Coast Air Quality Management District (SCAQMD) Protocol, which requires measurement of both condensable and filterable PM in accordance with SCAQMD’s Test Method 5.1.⁷⁶ We also note that the SIP-approved version of Rule 4354 (Glass Melting

⁷⁴ *See also* Letter dated April 25, 2011, from Lisa P. Jackson, EPA, to Paul Cort, Earthjustice, denying Petition for Reconsideration with respect to the deferral of the requirement to establish emission limits for condensable particulate matter (CPM) until January 1, 2011.

⁷⁵ In our proposed rule, we noted that the SJVUAPCD has deferred limits for CPM in its rules but that this limited deferral does not affect the Plan’s RACM/RACT and expeditious attainment demonstrations. *See* 76 FR 41338, 41342, fn. 12. We also noted that we would evaluate any PM_{2.5} rule adopted or revised by the District after January 1, 2011 to assure that it appropriately addresses CPM. *See id.*

⁷⁶ *See* SCAQMD Protocol, *Determination of Particulate and Volatile Organic Compound Emissions from Restaurant Operations*, November 14, 1997 (available at [http://yosemite.epa.gov/R9/R9Testmethod.nsf/0/3D4DEB4D21AB4AAAF882570AD005DFF69/\\$file/SC%20Rest%20emiss.pdf](http://yosemite.epa.gov/R9/R9Testmethod.nsf/0/3D4DEB4D21AB4AAAF882570AD005DFF69/$file/SC%20Rest%20emiss.pdf)) and SCAQMD Test Method 5.1, *Determination of Particulate Matter Emissions from Stationary Sources Using a Wet Impingement Train*, March 1989 (available at <http://aqmd.gov/tao/methods/stm/stm-005-1.pdf>).

Furnaces) requires testing for condensable PM emissions using EPA Method 202. *See* 76 FR 53640 (August 29, 2011).

Evaluation of potential to advance attainment

Table E-2 of our 2011 Proposal TSD indicates that to advance attainment of the 1997 PM_{2.5} standards in the SJV by one year, *i.e.*, from 2014 to 2013, the area would need an additional 15.6 tpd of NO_x reductions and an additional 3.9 tpd of direct PM_{2.5} reductions. These figures represent the difference between the 2013 “controlled inventory” and the 2014 “NO_x emissions level needed for PM_{2.5} attainment.” *See* 2011 Proposal TSD at Table E-2 (pg. 80).⁷⁷ The 2013 “controlled inventory” figures were based on the District’s expected emissions reductions from individual measures as identified in the 2008 PM_{2.5} Plan. *See* Plan at pp. 6-11 and 6-12 (Table 6-3).⁷⁸ Following adoption of these measures, however, the District updated its estimates of the emission reductions associated with several of these measures. *See* 2011 Proposal TSD at Table F-4 (pg. 91). Based on these updated estimates of the reductions associated with specific control measures, which alter the 2013 “controlled inventory” estimates, we have re-calculated the amount of PM_{2.5} reductions needed to advance attainment by one year as 6.4 tpd.⁷⁹

As discussed above, with respect to Rule 4692 (Charbroiling) and Rule 4103 (Open Burning), we have concluded that the additional PM emission control options that Earthjustice identified are not reasonably available considering economic and technical feasibility. Therefore, these potential control measures are not required RACM for purposes of the 1997 PM_{2.5} standards in the Valley. With respect to Rule 4901 (Wood Burning), Rule 4354 (Glass Melting Furnaces), and Rule 4352 (Solid Fuel-Fired Boilers), we assume for purposes of this analysis that additional control options are reasonably available for implementation in the SJV. We therefore evaluate whether the emission reductions from these additional control options would, collectively, advance attainment of the 1997 PM_{2.5} standards in the SJV by at least one year.

Our estimate of the total reductions of direct PM_{2.5} that could be achieved by the potential control options for wood burning (1.6 tpd) and glass melting furnaces (2.9 tpd) identified by Earthjustice is 4.5 tpd. As to NO_x reductions, although Earthjustice did not provide any estimate of the reductions that could be achieved by more stringent requirements for solid fuel-fired boilers, steam generators, and process heaters, we have conservatively estimated that such controls could result in an additional 3.12 tpd of NO_x reductions from existing emission units in the SJV. These combined emission reductions (4.5 tpd of direct PM_{2.5} and 3.12 tpd of NO_x) are significantly lower than the total reductions necessary to advance attainment by one year in the SJV (6.4 tpd of direct PM_{2.5} and 15.6 tpd of NO_x). Therefore, even assuming that additional

⁷⁷ For NO_x, 15.6 tpd represents the difference between the 2013 “controlled inventory” (306.8 tpd) and the 2014 “NO_x emissions level needed for PM_{2.5} attainment” (291.2 tpd). For PM_{2.5}, 3.9 tpd represents the difference between the 2013 “controlled inventory” (67.2 tpd) and the 2014 “Direct PM_{2.5} emissions level needed for PM_{2.5} attainment” (63.3 tpd).

⁷⁸ For example, the 2013 “controlled inventory” for PM_{2.5} (67.2 tpd) is the sum of the expected emissions reductions from four PM_{2.5} control measures identified in Table F-2. *See* 2011 Proposal TSD at Table E-2 (pg. 87).

⁷⁹ The updates to the PM_{2.5} emission reduction estimates reduced the creditable reductions from 6.7 tpd to 4.2 tpd, which in turn increased the 2013 “controlled inventory” from 67.2 tpd to 69.7 tpd. 6.4 tpd is the difference between the updated 2013 “controlled inventory” (69.7 tpd) and the 2014 “Direct PM_{2.5} emissions level needed for PM_{2.5} attainment” (63.3 tpd).

control options for these three source categories are reasonably available for implementation in the SJV, they are not required RACM for purposes of the 1997 PM_{2.5} standards because they would not advance the attainment date in SJV by at least one year. *See* 40 CFR § 51.1010(b).

Conclusion on RACM demonstration

For all of these reasons and as discussed in our proposed rule (76 FR 41338) and 2011 Proposal TSD, we conclude that the 2008 PM_{2.5} Plan includes all RACM (including RACT for stationary sources) necessary for RFP and expeditious attainment of the 1997 PM_{2.5} standards in the SJV and, therefore, satisfies the requirements of CAA section 172(c)(1) and 40 CFR § 51.1010.

Comment: Earthjustice lists a number of District rules (Rule 4352 (Solid Fuel-Fired Boilers), Rule 4402 (Crude Oil Production Sumps), Rule 4624 (Wastewater Separators), and Rule 4570 (Confined Animal Facilities)) that EPA has recently disapproved or partially disapproved as not meeting RACT and also lists a number of other District rules (Flares, Wine Fermentation, and Biosolids) that EPA had not acted on. It then argues the inadequacies in these rules, including the rules that cover sources of VOC, must be corrected before EPA can approve the District's RACM/RACT demonstration.

Response: All but two of the rules (Solid-Fuel-Fired Boilers and Flares) that Earthjustice lists are VOC rules. As discussed above, VOC is not an attainment plan precursor for the 1997 PM_{2.5} standards in the SJV and therefore does not need to be addressed in the 2008 PM_{2.5} SIP's RACM demonstration. As discussed above, we have evaluated whether more stringent requirements on solid fuel-fired boilers, when considered with other reasonable available measures, would advance attainment of the PM_{2.5} standards in SJV and have concluded they would not. EPA has recently proposed to find that SJVAPCD's revised flare rule, Rule 4311, meets CAA section 182(b)(2) RACT requirements. *See* 76 FR 52623 (August 23, 2011). SJVAPCD did not estimate the potential NO_x reductions from the revisions to Rule 4311. The total estimated emissions from flares subject to the rule are 0.4 tpd. *See* SJVUAPCD, "Final Draft Staff Report, Revised Proposed Amendments to Rule 4311 (Flares)," June 18, 2009, pp. 25-26.

Comment: Earthjustice states that the District evaluated just twenty-four of its rules for the RACM/RACT demonstration (citing Appendix I of the 2008 PM_{2.5} Plan) and identified thirteen rules. It states that EPA has approved only six into the SIP.

Response: The District evaluated most of its rules that control particulate matter, SO_x, or NO_x as part of its evaluation of potential controls for the 2008 PM_{2.5} SIP. *See* 2008 PM_{2.5} Plan, Appendix I. We note that the District completed a comprehensive review of its NO_x rules as part of its 2007 Ozone Plan which was adopted one year prior to the 2008 PM_{2.5} Plan and also undertook a comprehensive review of these rules for its 2006 Ozone RACT SIP required by CAA section 182(b)(2) and (f) which was adopted 2 years prior to the 2008 PM_{2.5} Plan. *See* Appendices H and I of that 2007 Ozone Plan. The great majority of the District's rules control VOC from sources that only emit VOC. *See* Appendix B of this TSD. EPA has found that VOC is not an attainment plan precursor for purposes of the 1997 PM_{2.5} standards in the SJV. *See* section II.C. of this TSD. As a result of this finding, VOC controls are not needed in the SJV 2008 PM_{2.5} SIP.

Of the thirteen District control measures that it committed to adopt, one is not scheduled for adoption until 2014 (revisions to Rule 4905 – gas residential furnaces), one was just adopted

in August 2011 and has not yet been submitted for EPA's review (Rule 4702 – internal combustion engines), and one EPA expects to take action on in the next few months (Rule 9410 – employer trip reduction). The ten remaining rules have all been approved or proposed for approval. *See* Table F-3 in this TSD.

Comment: In its January 31, 2011 letter, Earthjustice comments that the District's revised plan must explain why available measures have not been included in the RACM/RACT demonstration and have not been offered to advance attainment. Earthjustice notes that EPA points out, in its discussion of the contingency provisions, this requirement for the boilers and internal combustion engine rules (Rules 4307 and 4702), but ignores this same problem in the District's decision to forgo more aggressive wood burning requirements.

Response: We note that both Rule 4307 and 4702 were considered part of the District's initial control strategy (*See* 2008 PM_{2.5} Plan, Table 6-2); however, reductions from the rules were not determined at the time of the Plan's submittal and therefore not included either the RFP or the attainment demonstration. *See* 2008 PM_{2.5} Plan, Table 6-3. In its 2010 proposal, EPA was proposing to disapprove both of these demonstrations based, in part, on insufficient emissions reductions. *See* 75 FR 74518, 74539. Given that these two rules were part of control strategy, EPA believed that reductions from these measures should be credited to the RFP and attainment demonstrations first and not withheld for contingency purposes. EPA was not suggesting that these measures would provide for more expeditious attainment since they were already part of the control strategy.

These rules have now been adopted and reductions from Rule 4307 have been incorporated into both the RFP and attainment demonstrations. *See* Table F-4 of this TSD. Rule 4702 was adopted in August 2011 and has compliance dates as early as 2014. The reductions from this rule in 2014 will contribute toward fulfilling the District's outstanding emissions reductions commitments.

The contingency provision in Rule 4103 was not part of the initial control strategy and is will only be triggered should the area fail to attain by April 5, 2015. We discussed above whether this rule's contingency provision is RACM for the 1997 PM_{2.5} standards in the SJV.

F. Control Strategy and Enforceable Commitments

1. Baseline Measures

Comment: Earthjustice and AIR assert that the baseline inventories are flawed because they include emissions reduction credit from both "waiver measures" and "non-waiver measures" adopted before December 2006 (together referred to as "baseline measures") that have not been approved into the SIP, and that the inclusion of credit for these baseline measures undermines the attainment and progress demonstrations attached to these inventories. For example, both commenters object to the inclusion of credit for CARB's anti-idling requirements in the baseline inventories because these requirements have never been submitted for SIP approval, and Earthjustice suggests that EPA should have adjusted the credit for these anti-idling requirements based on CARB's failure to enforce them. Both commenters assert that EPA has not specifically evaluated these baseline measures to determine how they should be credited in the baseline inventories, and Earthjustice asserts that the measures upon which the attainment and progress

demonstrations rely must be enforceable, creditable controls approved into the SIP subject to the CAA's anti-backsliding provisions.

In addition, based on information provided in Table 7 of the 2011 Proposal and tables F-7 and F-9 of the 2011 Proposal TSD, AIR provides its own calculations of the total amount of emission reduction credits attributed to baseline measures and requests that EPA confirm the accuracy of AIR's calculations.

Finally, AIR asserts that these additional "non-waiver" baseline measures should also be SIP-approved:

- Heavy Duty Diesel Chip Reflash (adopted March 27, 2004);
- Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities (adopted December 8, 2005);
- Solid Waste Collection Vehicle Rule (adopted September 24, 2003);
- Fork Lifts and Other Industrial Equipment (adopted May 26, 2006);
- Pesticides – Field Fumigant Limits (submitted to EPA October 12, 2009).

Response: We disagree that there is any inadequacy in the emissions projections that undermines the RACM, RFP or attainment demonstrations in the 2008 PM_{2.5} Plan. We explained in our 2011 proposal (76 FR 41338, 41342, 41343) our reasons for concluding both that the 2005 base year inventory in the 2008 PM_{2.5} Plan is comprehensive, accurate, and current as required by CAA section 172(c)(3) and that the projected baseline inventories for 2009, 2012 and 2014 provide adequate bases for the RACM, RFP and attainment demonstrations in the Plan.

With respect to mobile source emissions, we believe that credit for emissions reductions from implementation of California mobile source rules that are subject to CAA section 209 waivers ("waiver measures") is appropriate notwithstanding the fact that such rules are not approved as part of the California SIP. In the TSD supporting our 2011 proposal, we explained why we believe such credit is appropriate. *See* 2011 Proposal TSD at section II.F.4.a.i. Historically, EPA has granted credit for the waiver measures because of special Congressional recognition, in establishing the waiver process in the first place, of the pioneering California motor vehicle control program and because amendments to the CAA (in 1977) expanded the flexibility granted to California in order "to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare" (H.R. Rep. No. 294, 95th Congr., 1st Sess. 301-2 (1977)). In allowing California to take credit for the waiver measures notwithstanding the fact that the underlying rules are not part of the California SIP, EPA treated the waiver measures similarly to the Federal motor vehicle control requirements, which EPA has always allowed States to credit in their SIPs without submitting the program as a SIP revision.

EPA's historical practice has been to give SIP credit for motor-vehicle-related waiver measures by allowing California to include motor vehicle emissions estimates made by using California's EMFAC (and its predecessors) motor vehicle emissions factor model in SIP inventories. EPA verifies the emissions reductions from motor-vehicle-related waiver measures through review and approval of EMFAC, which is updated from time to time by California to reflect updated methods and data, as well as newly-established emissions standards. (Emissions

reductions from EPA's motor vehicle standards are reflected in an analogous model known as MOVES.⁸⁰) The 2008 PM_{2.5} Plan was developed using a version of the EMFAC model referred to as EMFAC2007, which EPA has approved for use in SIP development in California. *See* 73 FR 3464 (January 18, 2008). Thus, the emissions reductions that are from the California on-road "waiver measures" and that are estimated through use of EMFAC are as verifiable as are the emissions reductions relied upon by states other than California in developing their SIPs based on estimates of motor vehicle emissions made through the use of the MOVES model. All other states use the MOVES model (and prior to release of MOVES, the MOBILE model) in their baseline inventories without submitting the federal motor vehicle regulations for incorporation into their SIPs.

Similarly, emissions reductions that are from California's waiver measures for non-road engines and vehicles (e.g., agricultural, construction, lawn and garden and off-road recreation equipment) are estimated through use of CARB's OFFROAD emissions factor model.⁸¹ (Emissions reductions from EPA's non-road engine and vehicle standards are reflected in an analogous model known as NONROAD). Since 1990, EPA has treated California non-road standards for which EPA has issued waivers in the same manner as California motor vehicle standards, *i.e.*, allowing credit for standards subject to the waiver process without requiring submittal of the standards as part of the SIP. In so doing, EPA has treated the California non-road standards similarly to the Federal non-road standards, which are relied upon, but not included in, various SIPs. *See* generally 2011 Proposal TSD at section II.F.4.a.i.

CARB's EMFAC and OFFROAD models employ complex routines that predict vehicle fleet turnover by vehicle model years and include control algorithms that account for all adopted regulatory actions which, when combined with the fleet turnover algorithms, provide future baseline projections. *See* 2007 State Strategy, Appendix F at 7-8. For stationary sources, the California Emission Forecasting System (CEFS) projects future emissions from stationary and area sources (in addition to aircraft and ships) using a forecasting algorithm that applies growth factors and control profiles to the base year inventory.⁸² *See id.* at 7. The CEFS model integrates the projected inventories for both stationary and mobile sources into a single database to provide a comprehensive statewide forecast inventory, from which nonattainment area inventories are extracted for use in establishing future baseline planning inventories. *See id.* In 2011, CARB updated the baseline emissions projections for several source categories to account for, among other things, more recent economic forecasts and improved methodologies for estimating emissions from the heavy duty truck and construction source categories. *See* 2011 Progress Report at Appendix E. These methodologies for projecting future emissions based on growth factors and existing Federal, State, and local controls were consistent with EPA guidance on developing projected baseline inventories. *See* 2011 Proposal TSD at section II.A; *see also*

⁸⁰ MOVES replaced the MOBILE model as EPA's on-road mobile source emission estimation model for use in SIPs and conformity in 2010.

⁸¹ Information about CARB's emissions inventories for on-road and non-road mobile sources, and the EMFAC and OFFROAD models used to project changes in future inventories, is available at <http://www.arb.ca.gov/msei/msei.htm>.

⁸² Information on base year emissions from stationary point sources is obtained primarily from the districts, while CARB and the districts share responsibility for developing and updating information on emissions from various area source categories. *See* 2007 State Strategy, Appendix F at 21.

“Procedures for Preparing Emissions Projections,” EPA Office of Air Quality Planning and Standards, EPA-450/4-91-019, July 1991; “Emission Projections,” STAPPA/ALAPCO/EPA Emission Inventory Improvement Project, Volume X, December 1999 (available at <http://www.epa.gov/ttnchie1/eiip/techreport/volume10/x01.pdf>).

In sum, the 2005 base year and future projected baseline inventories in the 2008 PM_{2.5} Plan were prepared using a complex set of CARB methodologies to estimate and project emissions from stationary sources, in addition to the most recent emissions factors and models and updated activity levels for emissions associated with mobile sources, including: (1) the latest EPA-approved California motor vehicle emissions factor model (EMFAC2007) and the most recent motor vehicle activity data from each of the MPOs in the San Joaquin Valley; (2) improved methodologies for estimating emissions from specific source categories; and (3) CARB's non-road mobile source model (the OFFROAD model). *See* TSD at section II.A. (referencing, *inter alia*, 2007 State Strategy at Appendix F) and 2011 Progress Report. EPA has approved numerous California SIPs that rely on base year and projected baseline inventories including emissions estimates derived from the EMFAC, OFFROAD, and CEFS models. *See, e.g.*, 65 FR 6091 (February 8, 2000) (proposed rule to approve 1-hour ozone plan for South Coast) and 65 FR 18903 (April 10, 2000) (final rule); 70 FR 43663 (July 28, 2005) (proposed rule to approve PM-10 plan for South Coast and Coachella Valley) and 70 FR 69081 (November 14, 2005) (final rule); 74 FR 66916 (December 17, 2009) (direct final rule to approve ozone plan for Monterey Bay). The commenter has provided no information to support a claim that these methodologies for developing base year inventories and projecting future emissions in the SJV are inadequate to support the RACM, RFP, and attainment demonstrations in the 2008 PM_{2.5} Plan.

For all of these reasons and as discussed in our 2011 proposal (76 FR 41338, 41342, 41343), we have concluded that the 2005 base year inventory in the 2008 PM_{2.5} Plan is a “comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants” in the SJV area, consistent with the requirements for emissions inventories in CAA section 172(c)(3), 40 CFR § 51.1008, and 40 CFR part 51, subpart A. In addition, we conclude that the projected baseline inventories for 2009, 2012 and 2014 were prepared consistent with EPA’s guidance on development of emissions inventories and attainment demonstrations and, therefore, provide an adequate basis for the RACM, RFP and attainment demonstrations in the Plan. *See* 2011 Proposal TSD at section II.A.

As to the six specific baseline measures that CRPE asserts should be SIP-approved, we note first that the SJV 2008 PM_{2.5} SIP does not rely on credit for emission reductions from the Pesticides regulations (Field Fumigant Limits) as those regulations do not apply to any pollutant that is a PM_{2.5} attainment plan precursor in the SJV (PM_{2.5}, NO_x, or SO₂).

Second, both the Requirements to Reduce Idling Emissions from New and In-Use Trucks (effective November 15, 2006)⁸³ and the Fork Lifts and Other Industrial Equipment measure

⁸³ EPA is currently reviewing a request from CARB for a determination as to whether certain requirements of these anti-idling rules are preempted by sections 209(a) of the CAA; certain provisions are conditions precedent pursuant to section 209(a) of the Act; certain provisions are within-the-scope of previous waivers and authorizations issued pursuant to sections 209(b) and 209(e) of the Act, respectively; and at least one provision requires and merits a full authorization pursuant to section 209(e) of the Act. *See* 75 FR 43975 (July 27, 2010). CARB estimates that the operational requirement of the anti-idling rule, which is not subject to a CAA section 209 waiver, achieves 0.2 tpd of NO_x in the SJV. *See Memorandum*, Doris Lo, Air Division, Planning Office (AIR-2); to San Joaquin Valley PM_{2.5}

(adopted May 26, 2006) are pending EPA waiver determinations under CAA section 209(b) or section 209(e).⁸⁴ We expect that EPA will act on these requests for waivers of preemption or authorization under CAA section 209 in the near term, and that our final approval of the 2008 PM_{2.5} Plan based in part on its reliance on the emissions reductions associated with these rules is, therefore, reasonable and appropriate. If, however, EPA either denies or does not issue the State's requested waiver for any of these measures prior to the effective date of today's action, we will take appropriate remedial action to ensure that our action on the plan is fully supportable or to reconsider that action.

Third, as to the Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities (adopted December 8, 2005), CARB's staff report on this measure indicates that the projected baseline inventories have attributed emission reductions of 0.1 tpd PM_{2.5} and 0.18 tpd NO_x statewide to this measure. See Staff Report: Proposed Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities, October 2005, at pg. 55. Assuming less than 25 percent of these reductions are attributed to the SJV area, the *de minimis* amounts of emission reductions attributed to this measure in the 2008 PM_{2.5} SIP do not affect our evaluation of the attainment and RFP demonstrations in the 2008 PM_{2.5} SIP.

Similarly, as to the Solid Waste Collection Vehicle Rule (adopted September 24, 2003), CARB's staff report on this measure indicates that the projected baseline inventories have attributed emission reductions of 0.17 tpd PM_{2.5} and 2.3 tpd NO_x statewide to this measure. See Supplemental Staff Report: Proposed Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles, August 8, 2003, at pg. 18. Assuming less than 25 percent of these reductions are attributed to the SJV area, the *de minimis* amounts of emission reductions attributed to this measure in the 2008 PM_{2.5} SIP also do not affect our evaluation of the attainment and RFP demonstrations in the 2008 PM_{2.5} SIP.

Finally, the Heavy Duty Diesel Engine-Chip Reflash rule (adopted March 27, 2004) ("Chip Reflash" rule) was intended to ensure expeditious compliance with CARB's NO_x emission standard for heavy-duty diesel (HDD) engines by requiring installation of "Low-NO_x Software." The Chip Reflash rule was invalidated in part by a California State Court, and CARB repealed the related regulations in June 2007. The emission reduction credit attributed to Chip Reflash in CARB's baseline inventories is limited to vehicles that have been "reflashed," *i.e.*, physically installed the Low-NO_x Software,⁸⁵ removal of which would constitute a violation of

Docket No. EPA-R09-OAR-2010-0516 "South Coast and San Joaquin Valley Emissions Reductions from ARB's Operational Idling Requirements," September 28, 2011.

⁸⁴ See letter, James Goldstene, Executive Officer, CARB to Stephen L. Johnson, Administrator, EPA RE: Request for Authorization Determination Pursuant to Clean Air Act Section 209(e) for Amendments to California's Off-Road Emissions Standards Regulation for large Spark-Ignition (LSI) Engines and Fleet Requirement for In-Use LSI Forklifts and Other Industrial Equipment and California State Motor Vehicle and Nonroad Engine Pollution Control Standards; Truck Idling Requirements; Opportunity for Public Hearing and Request for Public Comment; Notice Of Opportunity For Public Hearing And Comment. 75 FR 43975 (July 27, 2010)

⁸⁵ The 2007 State Strategy, Appendix A, "Emission Inventory Output Tables" documents the adjustment in the baseline that CARB made to account for Chip Reflash (or Heavy-Duty Diesel Engine Software Upgrade). As described in appendix A, CARB staff estimates that the overall benefits of the software upgrade regulation plus related actions provided approximately 38 tons per day of NO_x emissions reductions statewide in year 2007. CARB also indicates that it took into account the fact that the software upgrade regulation had been invalidated by including no additional emissions reductions from chip reflash other than those that had already occurred due to

the CAA and/or California state law. *See* the statutory anti-tampering laws in CAA section 203(a)(3) and California Vehicle Code section 27156. Thus, the NO_x emissions reductions attributed to “reflashed” engines are enforceable under the CAA and/or California state law.

As to AIR’s calculation of the reductions from baseline measures, AIR calculates what it considers “the total reductions from baseline reductions without recession reductions” to be 11 tpd of PM_{2.5}, 195 tpd of NO_x, and 0.9 tpd of SO_x. These figures are not correct because they do not take into account CARB’s recent updates to the projected 2014 inventory.

For the 2008 PM_{2.5} SIP, “baseline reductions” are calculated by subtracting the 2005 base year inventory from the projected 2014 pre-control-strategy inventory. As we have discussed above, CARB revised its projected 2014 inventories to incorporate not only the continuing effects of the recent economic recession but also many non-recession related changes. These revisions have resulted in a more accurate projected 2014 inventory.

As we have discussed previously, projected emissions inventories are a function in part of changes in activity. Projected inventories are, therefore, necessarily affected by forecasts of industrial growth, population growth, and transportation growth, among other factors. EPA guidance emphasizes the importance of developing reliable methods for estimating future source activity levels as part of the SIP planning process. We believe that CARB has done this.

2. Waiver Measures

Comment: Earthjustice and AIR object to our proposal to grant emissions reduction credit to California’s mobile source control measures that have received a waiver of preemption under CAA section 209 without first approving them into the SIP. Both commenters argue that our reliance for this proposal on the general savings clause in CAA section 193 is inappropriate for several reasons.

First, the commenters assert that CAA section 193 only saves those “formal rules, notices, or guidance documents” that are not inconsistent with the CAA. They argue that both the CAA and EPA’s long-standing policies and regulations require SIPs to contain the state and local emission limitations and control measures that are necessary for attainment and RFP and to meet other CAA requirements. They assert that our position on the treatment of California’s waived measures is inconsistent with this requirement. AIR asserts that EPA has, in contrast, approved other (non-mobile source) state measures into the SIP, e.g., the consumer products rules and fuel standards. Earthjustice also argues that only SIP approval provides for the CAA’s enforcement oversight (CAA sections 179 and 304) and anti-backsliding (CAA section 110(l) and 193) safeguards.

Second, the commenters argue that we cannot claim that our position was ratified by Congress because section 193 saves only regulations, standards, rules, notices, orders and guidance “promulgated or issued” by the Administrator and we have not identified documents

compliance with the regulation (prior to invalidation by the court), voluntary upgrade programs, ongoing engine rebuilds, engines upgrades by manufacturers exempt from the regulation, and interstate trucks. CARB staff recently confirmed that the baseline adjustment for chip reflash in the 2007 State Strategy reflects emission reduction credit only for engines that have been “reflashed.” *See Memorandum*, Doris Lo, Air Division, Planning Office (AIR-2); to the San Joaquin Valley PM_{2.5} Docket No. EPA-R09-OAR-2010-0516, “SIP Credit for Heavy-Duty Diesel Engine Low-NO_x Software (“Chip Reflash”)”; September 28, 2011.

promulgated or issued by EPA that establish our position here. Earthjustice further asserts that our interpretation has not been expressed through any affirmative statements and the only statements of relevant statutory interpretations are contrary to our position on California's waived measures.

Third, Earthjustice argues that there is no automatic presumption that Congress is aware of an agency's interpretations and we have not provided any evidence that Congress was aware of our interpretation regarding the SIP treatment of California's mobile source control measures. Similarly, CRPE argues that our positions that Congress must expressly disapprove of EPA's long-standing interpretation and Congressional silence equates to a ratification of EPA's interpretation are incorrect.

Finally, AIR argues that waiver measures may not be used in attainment demonstrations because EPA makes no finding during the waiver process that the rules achieve the reductions claimed or that the measures are SIP creditable. AIR also notes that these issues are the subject of litigation in the 9th Circuit U.S. Court of Appeals in *Sierra Club v. EPA*, Consolidated Case Nos. 10-71457 and 10-71458.

Response: We continue to believe that credit for emissions reductions from implementation of California mobile source rules that are subject to CAA section 209 waivers ("waiver measures") is appropriate notwithstanding the fact that such rules are not approved as part of the California SIP. In our 2011 proposal and 2011 Proposal TSD, we explained why we believe such credit is appropriate. See 76 FR 41338, 41345 and 2011 Proposal TSD at section II.F.4.a.i. Historically, EPA has granted credit for the waiver measures because of special Congressional recognition, in establishing the waiver process in the first place, of the pioneering California motor vehicle control program and because amendments to the CAA (in 1977) expanded the flexibility granted to California in order "to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare," (H.R. Rep. No. 294, 95th Congr., 1st Sess. 301-2 (1977)). In allowing California to take credit for the waiver measures notwithstanding the fact that the underlying rules are not part of the California SIP, EPA treated the waiver measures similarly to the Federal motor vehicle control requirements, which EPA has always allowed States to credit in their SIPs without submitting the program as a SIP revision. As we explained in the 2011 Proposal TSD (pp. 100-102), credit for Federal measures, including those that establish on-road and nonroad standards, notwithstanding their absence in the SIP, is justified by reference to CAA section 110(a)(2)(A), which establishes the following content requirements for SIPs: "... enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), ... , as may be *necessary or appropriate* to meet the applicable requirements of this chapter." (emphasis added). Federal measures are permanent, independently enforceable (by EPA and citizens), and quantifiable without regard to whether they are approved into a SIP, and thus EPA has never found such measures to be "necessary or appropriate" for inclusion in SIPs to meet the applicable requirements of the Act. Section 209 of the CAA establishes a process under which EPA allows California's waiver measures to substitute for Federal measures, and like the Federal measures for which they substitute, EPA has historically found, and continues to find, based on considerations of permanence, enforceability, and quantifiability, that such measures are not "necessary or appropriate" for California to include in its SIP to meet the applicable requirements of the Act.

First, with respect to permanence, we note that, to maintain a waiver, CARB's on-road waiver measures can be relaxed only to a level of aggregate equivalence to the Federal Motor Vehicle Control Program (FMVCP). *See* section 209(b)(1). In this respect, the FMVCP acts as a partial backstop to California's on-road waiver measures (i.e., absent a waiver, the FMVCP would apply in California). Likewise, Federal nonroad vehicle and engine standards act as a partial backstop for corresponding California nonroad waiver measures. The constraints of the waiver process thus serve to limit the extent to which CARB can relax the waiver measures for which there are corresponding EPA standards, and thereby serve an anti-backsliding function similar in substance to those established for SIP revisions in CAA sections 110(l) and 193.⁸⁶ Meanwhile, the growing convergence between California and EPA mobile source standards diminishes the difference in the emissions reductions reasonably attributed to the two programs and strengthens the role of the Federal program in serving as an effective backstop to the State program. In other words, with the harmonization of EPA mobile source standards with the corresponding State standards, the Federal program is becoming essentially a full backstop to most parts of the California program.

Second, as to enforceability, we note that the waiver process itself bestows enforceability onto California to enforce the on-road or nonroad standards for which EPA has issued the waiver. CARB has as long a history of enforcement of vehicle/engine emissions standards as EPA, and CARB's enforcement program is equally as rigorous as the corresponding EPA program. The history and rigor of CARB's enforcement program lends assurance to California SIP revisions that rely on the emissions reductions from CARB's rules in the same manner as EPA's mobile source enforcement program lends assurance to other state's SIPs in their reliance on emissions reductions from the FMVCP. While it is true that citizens and EPA are not authorized to enforce California waiver measures under the Clean Air Act (i.e., because they are not in the SIP), citizens and EPA are authorized to enforce EPA standards in the event that vehicles operate in California without either California or EPA certification.

As to quantifiability, EPA's historical practice has been to give SIP credit for motor-vehicle-related waiver measures by allowing California to include motor vehicle emissions estimates made by using California's EMFAC (and its predecessors) motor vehicle emissions factor model in SIP inventories. EPA verifies the emissions reductions from motor-vehicle-related waiver measures through review and approval of EMFAC, which is updated from time to time by California to reflect updated methods and data, as well as newly-established emissions standards. (Emissions reductions from EPA's motor vehicle standards are reflected in an analogous model known as MOVES.) The EMFAC model is based on the motor vehicle emissions standards for which California has received waivers from EPA but accounts for vehicle deterioration and many other factors. The motor vehicle emissions estimates themselves combine EMFAC results with vehicle activity estimates, among other considerations. *See* the 1982 Bay Area Air Quality Plan, and the related EPA rulemakings approving the plan (*See* 48 FR 5074 (February 3, 1983) for the proposed rule and 48 FR 57130 (December 28, 1983) for

⁸⁶ In addition, the commenters' concerns over the potential for relaxation by the State of the waiver measures because the underlying regulations are not subject to EPA review and approval as a SIP revision are not a practical concern for this particular plan given that the plan's horizon is very short term (next couple of years), and the on-road and nonroad vehicles that in part will determine whether the area attains the standard are already in operation or in dealer showrooms. There is no practical means for the State to relax the standards of vehicles already manufactured, even if the State wanted to relax the standards.

the final rule) as an example of how the waiver measures have been treated historically by EPA in California SIP actions.⁸⁷ The San Joaquin Valley plan was developed using a version of the EMFAC model referred to as EMFAC2007, which EPA has approved for use in SIP development in California. *See* 73 FR 3464 (January 18, 2008). Thus, the emissions reductions that are from the California on-road “waiver measures” and that are estimated through use of EMFAC are as verifiable as are the emissions reductions relied upon by states other than California in developing their SIPs based on estimates of motor vehicle emissions made through the use of the MOBILE model.

Moreover, EPA’s waiver review and approval process is analogous to the SIP approval process. First, CARB adopts its emissions standards following notice and comment procedures at the state level, and then submits the rules to EPA as part of its waiver request. When EPA receives new waiver requests from CARB, EPA publishes a notice of opportunity for public hearing and comment and then publishes a decision in the **Federal Register** following the public comment period. Once again, in substance, the process is similar to that for SIP approval and supports the argument that one hurdle (the waiver process) is all Congress intended for California standards, not two (waiver process plus SIP approval process). Second, just as SIP revisions are not effective until approved by EPA, changes to CARB’s rules (for which a waiver has been granted) are not effective until EPA grants a new waiver, unless the changes are “within the scope” of a prior waiver and no new waiver is needed. Third, both types of final actions by EPA—i.e., final actions on California requests for waivers and final actions on state submittals of SIPs and SIP revisions may be challenged under section 307(b)(1) of the CAA in the appropriate United States Court of Appeals.

In the 2011 Proposal TSD (pp. 102-103), we indicated that we believe that section 193 of the CAA, the general savings clause added by Congress in 1990, effectively ratified our long-standing practice of granting credit for the California waiver rules because Congress did not insert any language into the statute rendering EPA’s treatment of California’s motor vehicle standards inconsistent with the Act. Rather, Congress extended the California waiver provisions to most types of nonroad vehicles and engines, once again reflecting Congressional intent to provide California with the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare. Requiring the waiver measures to undergo SIP review in addition to the statutory waiver process is not consistent with providing California with

⁸⁷ EPA’s historical practice in allowing California credit for waiver measures notwithstanding the absence of the underlying rules in the SIP is further documented by reference to EPA’s review and approval of a May 1979 revision to the California SIP entitled, “Chapter 4, California Air Quality Control Strategies.” In our proposed approval of the 1979 revision (44 FR 60758, October 22, 1979), we describe the SIP revision as outlining California’s overall control strategy, which the State had divided into vehicular sources and non-vehicular (stationary source) controls. As to the former, the SIP revision discusses vehicular control measures as including technical control measures and transportation control measures. The former refers to the types of measures we refer to herein as waiver measures, as well as fuel content limitations, and a vehicle inspection and maintenance program. The 1979 SIP revision included several appendices, including appendix 4–E, which refers to “ARB vehicle emission controls included in title 13, California Administrative Code, chapter 3 * * *,” including the types of vehicle emission standards we refer to herein as waiver measures; however, California did not submit the related portions of the California Administrative Code (CAC) to EPA as part of the 1979 SIP revision submittal. With respect to the CAC, the 1979 SIP revision states: “The following appendices are portions of the California Administrative Code. Persons interested in these appendices should refer directly to the code.” Thus, the State was clearly signaling its intention to rely on the California motor vehicle control program but not to submit the underlying rules to EPA as part of the SIP. In 1980, we finalized our approval as proposed. *See* 45 FR 63843 (September 28, 1980).

the broadest possible discretion as to on-road and nonroad vehicle and engine standards, but rather, would add to the regulatory burden California faces in establishing and modifying such standards, and thus would not be consistent with Congressional intent. In short, we believe that Congress intended California's mobile source rules to undergo only one EPA review process (i.e., the waiver process), not two.

In summary, we disagree that our interpretation of CAA section 193 is fundamentally flawed. EPA has historically given SIP credit for waiver measures in our approval of attainment demonstrations and other planning requirements such as reasonable further progress and contingency measures submitted by California. We continue to believe that section 193 ratifies our long-standing practice of allowing credit for California's waiver measures notwithstanding the fact they are not approved into the SIP, and correctly reflects Congressional intent to provide California with the broadest possible discretion in the development and promulgation of on-road and nonroad vehicle and engine standards.⁸⁸

AIR correctly notes that EPA's treatment of California waiver measures in SIP actions is the subject of current litigation in *Sierra Club v. EPA*, Consolidated Case Nos. 10-71457 and 10-71458 (9th Circuit).

2. Enforceable Commitments

Comment: AIR argues that EPA cannot make a finding that the "recession reductions" are an "enforceable" measure within the meaning of CAA section 110(a)(2)(A) and 172(c)(6) because "recession reductions" are only voluntary behavior to reduce activity for economic reasons and nothing prevents such an increase in activity as the economy improves. Based on this argument, AIR asserts that EPA's approval of the attainment demonstration is arbitrary and capricious and not in accordance with the law. AIR asserts that CARB concedes that the reductions coming from reduced activity may change in the future.

Response: EPA is not making a finding that emission "reductions" related to the economic recession are "enforceable" measures under CAA sections 110(a)(2)(A) and 172(c)(6). As explained in our amended proposal (76 FR 41338, 41354-41356), we are concluding that CARB's 2011 SIP revisions, which updated the State's projected ("baseline") emissions inventories based on improved methodologies for estimating emissions and more recent growth factors, reduced the total amount of emission reductions needed for attainment and that the control strategy in the 2008 PM_{2.5} Plan, as revised in 2011, demonstrates expeditious attainment of the 1997 PM_{2.5} NAAQS in the SJV from the revised baseline.

Section 110(a)(2)(A) of the CAA requires that each implementation plan submitted by a State include "enforceable emission limitations and other control measures, means, or techniques... as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of [the CAA]." Section 172(c)(6) contains substantively identical requirements for all nonattainment area plans. Baseline emissions

⁸⁸ In this regard, we disagree that we are treating the waiver measures inconsistently with other California control measures, such as consumer products and fuels rules, for the simple reason that, unlike the waiver measures, there is no history of past practice or legislative history supporting treatment of other California measures, such as consumer products rules and fuels rules, in any manner differently than is required as a general rule under CAA section 110(a)(2)(A), i.e., state and local measures that are relied upon for SIP purposes must be approved into the SIP.

inventories, however, are not “enforceable emission limitations and other control measures, means, or techniques” or “schedules and timetables for compliance” that are necessary or appropriate to meet CAA requirements. *See El Comite Para El Bienestar de Earlimart v. Warmerdam*, 539 F.3d 1062 (9th Cir. 2008) (concluding that a baseline inventory is not an enforceable “standard or limitation” as defined by the CAA and is not, therefore, an independently enforceable aspect[] of the SIP”). Rather, baseline emissions inventories provide the basis for, among other things, the demonstrations of attainment and progress toward attainment required by CAA sections 172(c)(1) and 172(c)(2). Specifically, CAA section 172(c)(3) requires that each plan for a nonattainment area include “a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area...”). After developing this “base year” emissions inventory, States use modeling and other analyses to calculate future emissions projections and “target” emission levels, which then inform the State’s development of progress milestones and control strategies for attaining the NAAQS. *See* General Preamble at 13507-13510. In short, emissions inventories provide estimates of current and future emissions that, in turn, provide the starting point for the State’s attainment demonstration and enforceable control strategy.

Nothing in the CAA precludes a State from revising a submitted plan to take into account revised emissions estimates and projections. All projections of future emissions-generating activity (including the original projections in the 2008 PM_{2.5} Plan that AIR would have CARB and EPA continue to use) are based on projections of population and employment and other growth factors that reflect voluntary behavior, all of which can increase or decrease as economic conditions change. However, reliance on projections from reputable sources of economic behavior based on established methods of predicting such behavior is the historic practice for development of emissions inventories. CARB’s revised projections of future emissions-generating activity are based on reputable sources, represent the most current understanding of expected economic conditions through at least 2014, and were subject to extensive public review and comment before CARB adopted its 2011 SIP revisions containing these updated projections. Given the magnitude of the economic recession’s impact on emissions-generating activity in SJV and other parts of California, and the resulting impact on the State’s assessment of the control strategy necessary to demonstrate attainment of the 1997 PM_{2.5} standards, we conclude that it is appropriate to take these updated emissions projections into account as part of our action on the 2008 PM_{2.5} Plan. Other than asserting generally that CARB and EPA should not rely on the revised economic data to determine the reductions needed for attainment and that future conditions may change, AIR provides no information that undermines the State’s revised economic data or the related changes to the projected inventories.

We disagree with AIR’s unsupported assertion that “CARB concedes that the reductions coming from reduced activity may change in the future.” CARB has stated that it will continue to track emission trends to ensure that the 2014 emission targets are met and maintains its commitment to adopt and implement additional control requirements, incentive programs, or other measures as appropriate to reduce emissions to the levels necessary to attain. *See* 2011 Progress Report, p. 4.

Moreover, as discussed above, the revisions to the 2014 baseline inventory that AIR characterizes as “recession reductions” took into account not only the State’s revised economic forecasts but numerous other factors, including updated activity data and growth projections. *See* section III.B. (“Emissions Inventory”) above.

Comment: AIR asserts that the Plan relies on emission reductions caused by the recent economic recession to demonstrate attainment, rather than requiring reductions from diesel trucks and other diesel equipment in 2014. Noting CARB's recent revisions to five of its in-use rules,⁸⁹ AIR argues that these rule revisions "reduc[ed] the amount of reductions that those five in-use rules would have achieved by 2014," and that CARB has equated recession-related emission reductions with the reductions necessary to meet the 2014 tonnage targets. AIR asserts that the difference between the pre-recession and recession inventories in the Valley is 40 tons per day of NO_x.

Response: As discussed above, CARB's revisions to the 2014 baseline inventories took into account not only the State's revised economic forecasts but numerous other factors, including updated activity data and growth projections. *See* section III.B. ("Emissions Inventory") above. These improvements to the emissions estimates reduced the projected 2014 emissions levels for trucks, buses and certain off-road equipment compared to the levels expected when CARB initially adopted its rules for these sources in 2007 and 2008. These revised projections, in turn, reduced the State's assessment of the amount of emission reductions needed from these emission sources to provide for attainment of the 1997 PM_{2.5} NAAQS in the SJV and allowed CARB to provide some economic relief to the affected industries.⁹⁰ We note that because EPA has not previously approved California's in-use truck rules into the SIP, EPA's approval of these rules strengthens the SIP and meets the requirements of CAA section 110(l). *See* CAA 110(l) (prohibiting EPA from approving a revision of a plan "if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress . . . or any other applicable requirement of [the Act]").

The revised Truck rule and the revised Off-Road rule continue to require reductions from diesel trucks and other diesel equipment in 2014 and future years. *See* 2010 Truck Rule ISOR, p. 45 and 2010 Off-Road ISOR, p. 38; *See also*, 76 FR 41338, 41346 (Table 6).

Comment: AIR claims that the 2011 Progress Report shows CARB considers "recession reductions" as a part of its "global" emission reduction commitment. In support of this claim, AIR quotes the 2011 Progress Report at page 4:

As a result of the recession, actual emission decreases moved California closer to the emissions levels needed for attainment in 2014. The recession has reduced economic activity and emissions, most notably in the goods movement sector. This has allowed ARB to maintain the State's SIP commitments in the South Coast and San Joaquin Valley while also providing some near-term economic relief to affected industries.

⁸⁹ These five in-use rules are CARB's Truck rule, Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Regulation, In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks Regulation, Off-Road rule, and LSI regulation (collective "in-use rules").

⁹⁰ To determine the extent to which it could revise its in-use rules to provide economic relief and still meet the attainment target, CARB evaluated whether the lower emissions from the revised inventories for both trucks, buses and off-road equipment, when combined with the effects of the recession, provided greater emissions reductions from the in-use rules than were initially expected. CARB referred to these greater-than-expected emissions reductions as the "emission margin." Because the in-use diesel rules reduced both direct PM_{2.5} and NO_x and both pollutants contribute to ambient levels of PM_{2.5}, CARB calculated the margin on a "NO_x equivalent" basis and found that the margin for the SJV was 40 tpd of NO_x equivalents. *See* 2010 Truck Rule ISOR, p. 23.

As the economy recovers, ARB will continue to track emission trends to ensure the 2014 emission targets are met. If future emissions were to exceed the SIP target, the State's commitment could be made up with additional controls, incentive programs, or other programs to bring emissions down to the necessary levels. A discussion of how ARB accounted for the recession is found later in this report.

Response: EPA is not treating any "recession reductions" as part of the State's enforceable commitments. As explained above, we are approving the attainment demonstration and control strategy in the 2008 PM_{2.5} Plan based on our conclusion that the Plan, as revised by CARB's 2011 revisions to the projected baseline inventories, demonstrates expeditious attainment of the PM_{2.5} standards in the SJV. EPA interprets the quoted language as a statement of CARB's future plans to revise the SIP as necessary should economic activity change significantly in the future.

Comment: AIR claims that in proposing to disapprove the CARB's global commitment in November 2010, EPA recognized that the Truck rule could reduce that percentage of reductions remaining as commitments below 10 percent. It then asserts that EPA cannot now approve the commitment and the attainment demonstration because CARB's relaxation of the Truck rule and the Off-Road rule to delay reductions beyond 2014 mean that the percentages of PM_{2.5} and NO_x reductions needed for attainment that remain as commitments are still well above the 10 percent threshold. AIR states that based on its calculations, the percentage of total reductions remaining as commitments, if adjustments to the baseline are not included, would be 25.1 percent for PM_{2.5} and 26.7 percent for NO_x.

Response: EPA did not propose to disapprove CARB's aggregate commitments in its 2010 proposal. We proposed then and again in our 2011 proposal to approve CARB's aggregate emissions reductions commitments as described in CARB Resolution 07-28, Attachment B. *See* 75 FR 74518, 74541 and 76 FR 41338, 41361. EPA did initially propose to disapprove the attainment demonstration based in part on our finding that the percentage of the emissions reductions needed for attainment that remained as commitments was too high. *See* 75 FR 74518, 74541. As explained in our 2011 proposal, however, additional submittals from CARB have reduced the percentages of emissions reductions remaining as commitments to 13.2 percent for direct PM_{2.5} and 4.5 percent for NO_x. These percentages are reasonably close to the 10 percent range that EPA has historically accepted as appropriate for enforceable commitments in approving attainment demonstrations. *See* 76 FR 41338, 41355-41356. Because the State's revisions to the projected baseline inventories in the SJV 2008 PM_{2.5} SIP have reduced the total tonnage of emission reductions necessary to attain the 1997 PM_{2.5} standards (*see* section III.B. above), we disagree with AIR's calculation of the percentage of total reductions remaining as commitments.

Comment: Earthjustice comments that EPA has outlined a three-factor test to assess whether the commitments in the SJV 2008 PM_{2.5} SIP are reasonable but has not documented, under the first factor, how we determine the level of remaining reductions and what is meant by "reasonably close."

Response: In our 2011 proposal we provide a detailed discussion of the emissions reductions needed for attainment and how they have been or will be achieved. *See* generally 76 FR 41338, 41344-41347 and 41354-41357 and 2011 Proposal TSD, sections II.F. and G. These reductions

include those from measures adopted prior to 2007 (baseline measures), measures adopted since 2007 and measures that are yet to be adopted (*i.e.*, enforceable commitments). The expected reductions from each of these sets of measures are provided in the 2011 proposal, as are EPA's calculations of the percentages of needed reductions remaining as commitments. *See* 76 FR 41338, 41354, Table 8; *see also* 2011 Proposal TSD at pp. 105-106 and 113-114. As provided in the tables in our 2011 proposal and 2011 Proposal TSD, the reductions remaining as commitments are 12.9 tpd of NO_x and 3.0 tpd of PM_{2.5}. *Id.* These reductions represent 4.5 percent and 13.2 percent of the total NO_x and PM_{2.5} emissions reductions (respectively) needed for attainment. *Id.*

In support of our statement that these percentages (4.5 percent of NO_x and 13.2 percent of PM_{2.5}) are "reasonably close to the 10 percent range that EPA has historically accepted in approving attainment demonstrations," we referenced several prior EPA approvals of SIPs relying on similar enforceable commitments. *See* 76 FR 41338, 41355 and n. 30. We also explained our legal rationale for approving such enforceable commitments and referenced several court decisions that support our interpretation of the CAA. *See id.* at n. 27 and 28. Based on our evaluations, we proposed to allow the State to rely on these limited enforceable commitments as part of the attainment demonstration in the 2008 PM_{2.5} Plan and 2007 State Strategy. *Id.* at 41356. Earthjustice does not explain why these explanations were not adequate or why reliance on enforceable commitments consistent with these court cases is inappropriate.

Comment: Earthjustice comments that it is not reasonable to approve a "plan to make a plan," which is what they believe the District and CARB have provided. Earthjustice states that the District and CARB are asking EPA to trust them that they will find emission reductions needed to meet the standards by 2015. Earthjustice states that this is not what the CAA contemplates, citing section 110(a)(2)(A) of the CAA (requiring plans to include "enforceable emission limitations and other control measures ... necessary or appropriate to meet the applicable requirements of this Act"). Earthjustice states that there is no point in having a plan which does not specifically identify how it plans to accomplish the needed reductions.

Response: We disagree with Earthjustice's assertion that the 2008 PM_{2.5} SIP does not identify how CARB and the SJVUAPCD plan to accomplish the reductions needed for attainment of the 1997 PM_{2.5} standards in the SJV by 2015. As discussed in our amended proposal, the 2008 PM_{2.5} Plan relies principally on adopted measures approved into the SIP or given waivers under CAA section 209 to achieve the emissions reductions needed to attain the 1997 PM_{2.5} standards in the SJV by April 5, 2015, including baseline (pre-2007) measures that continue to achieve emission reductions through 2014. *See* 76 FR 41338, 41356. The balance of the needed reductions is currently in the form of enforceable commitments that account for 13.2 percent of the direct PM_{2.5} and 4.5 percent of the NO_x emission reductions needed from 2005 levels to attain. *See id.* These SIP-approved or CAA-waived control measures and enforceable commitments satisfy the requirement in CAA section 110(a)(2)(A) to include "enforceable emission limitations and other control measures, means or techniques . . . as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements" of the CAA. *See id.* at 41355, n. 27. Although CARB's and the District's enforceable commitments to achieve additional emission reductions are expressed in aggregate tonnages and not tied to specific measures, both CARB and the District have provided a list of potential measures that may achieve the additional reductions needed to attain the standards, together with expeditious rule development, adoption, and implementation schedules consistent with EPA's policy on

acceptable enforceable commitments. *See id.* at 41355, 41356. Both CARB and the District have also made significant progress to date in meeting their enforceable commitments. *Id.*

Comment: AIR notes that one of EPA's criteria for evaluating an attainment demonstration that relies on commitments is whether the state is capable of fulfilling the commitment. AIR argues that CARB is not capable of fulfilling its commitment given CARB's alleged use of "recession reductions" instead of actual measures to meet its commitment when diesel emissions can change based on economic forces that the State cannot control. It also claims that CARB's decision to revise its five in-use rules is evidence that CARB can and likely will amend rules in the future that may undermine its commitment.

Response: We disagree with AIR's assertion that CARB's revisions to the in-use rules or to its projected emissions levels based on updated economic forecasts undermine its commitments or demonstrate that the State is not capable of fulfilling its commitment. We discussed above in section III.B. our reasons for concluding that the revisions to the 2014 baseline emissions inventories are legitimate.

Contrary to AIR's assertions, CARB's rulemaking record for the revisions to its in-use rules indicate that the State intends to ensure that any future revisions to the rules will not undermine its SIP commitment. *See, e.g.,* 2010 Truck Rule ISOR, p. 2 and 2010 Off-Road Rule ISOR, p. 2 (stating that rule revisions should "continue progress toward cleaner air" and "meet state implementation plan (SIP) commitments"). Before revising its in-use rules, CARB calculated the maximum level of relief it could provide without violating its SIP commitment. This "SIP margin" was calculated as 40 tpd in NO_x equivalent (a weighted combination of NO_x and PM_{2.5} emissions) in the SJV. *See* 2010 Truck Rule ISOR, p. 23 and 2010 Off-Road Rule ISOR, p. 20. The revisions to the in-use rules did not decrease their combined benefits by more than this amount. 2010 Truck Rule ISOR, p. 51 and 2010 Off-Road Rule ISOR, p. 43. Thus, CARB's actions did not reflect any lack of intention to fully meet its enforceable commitments to provide emissions reductions sufficient for timely attainment.

Comment: Earthjustice also contends that the second factor for determining whether to approve an attainment demonstration that relies on commitments, whether the state is capable of meeting its commitment, is not met because CARB has repeatedly fallen short of achieving its estimated emissions reduction from its rules and has not begun to develop its Agricultural Equipment Rule which was to achieve 5 to 10 tons per day of NO_x in the SJV and be adopted by 2009. To support its argument, it points to the methodology changes associated with the Truck rule and Off-Road Rule and the "massive recession reductions" that have resulted in fewer reductions being needed from these rules. Earthjustice concludes that it does not believe that CARB is capable of meeting the "massive, last-minute commitments" relied upon in the Plan given CARB's history of avoiding satisfying its commitments. It also argues that CARB cannot rely on changes to the inventory to lessen the reductions from its rules without reassessing the relationship between emissions and ambient concentrations of fine particulates and that the "massive recession reductions" are neither permanent nor enforceable.

Response: We disagree with Earthjustice's assertion that CARB has a history of not satisfying its commitments or that the State's recent revisions to its future emissions projections indicate it is not capable of meeting its commitments. We discussed above in section III.B. our reasons for concluding that the revisions to the 2014 baseline emissions inventories are valid. We also note

that Earthjustice has provided no information or data to undermine CARB's revisions to its future emissions projections based on its revised economic forecasts and updated methodologies for estimating emissions.

In addition, Earthjustice's assertion that CARB's actions with respect to regulation of in-use agricultural equipment indicate it will not meet its enforceable commitment is unsupported. CARB recently adopted changes to its rulemaking schedule to establish an adoption date of 2013 for regulation of in-use agricultural equipment. *See* 2011 Ozone SIP Revisions, p. 3. The 2007 State Strategy indicates that this measure is expected to achieve 5 to 10 tpd NO_x reductions in 2017, well after the period covered by the 2008 PM_{2.5} SIP. *See* 2009 State Strategy Status Report, p. 16. CARB did not quantify any emissions reductions for this measure for 2014. *See id.* at 18. The fact that the State revised its adoption schedule for a measure that is not relied on for attainment or RFP in the SJV 2008 PM_{2.5} SIP does not establish that the State is generally incapable of meeting its enforceable commitments in that SIP. As discussed in the 2011 proposal and its TSD and in our response to comments on the air quality modeling above in section III.C., EPA has concluded as a technical matter that the revisions to the base year inventory are not significant enough to change the basic conclusions drawn from the air quality modeling or to warrant a new air quality modeling assessment at this time. *See* 76 FR 41338, 41349 and 2011 Proposal TSD, section II.B.

Comment: Earthjustice states that CAA sections 110(a)(2)(A) and 172(c)(6) require SIPs to contain "enforceable limitations...as may be necessary or appropriate" to achieve attainment. Earthjustice further states that, while section 110(k)(4) allows EPA to grant "conditional approval" of a SIP lacking certain statutory elements "based on a commitment of the state to adopt specific enforceable measures" by a date certain, the statute provides that the conditional approval automatically becomes a disapproval if the state fails to comply with the commitment within one year. Earthjustice then claims that EPA appears to be trying to avoid this limitation by treating open-ended promises of the State to reduce emissions as enforceable commitments even though the State has never specified exactly what it commits to do. Earthjustice states that courts have rejected similar attempts to circumvent the statute's limitations on conditional approval and cites *Sierra Club v. EPA*, 356 F.3d 296, 298(D.C. Cir. 2004) as overturning EPA's conditional approval of SIPs based in part on the fact that the commitments identified no specific measures the state would implement.

Response: As pertinent to the comment, *Sierra Club* involved EPA's conditional approval under section 110(k)(4) of SIPs lacking in their entirety RACM and rate-of-progress (ROP) demonstrations and contingency measures based on letters submitted by states that committed to cure these deficiencies. The court rejected EPA's construction of section 110(k)(4) as contrary to the unambiguous statutory language requiring the state to commit to adopt *specific* enforceable measures. *See Sierra Club* at 302. The court found that EPA's construction turned the section 110(k)(4) conditional approval into a means of circumventing SIP deadlines. *Id.* at 303.

EPA does not dispute the holding of *Sierra Club*. However that case is not germane to EPA's approval of CARB's and the District's commitments here because the Agency is not approving those commitments under section 110(k)(4). The relevant precedent is instead *BCCA Appeal Group v. EPA*, 355 F.3d 817 (5th Cir. 2003). The facts in *BCCA* were very similar to those presented here. In *BCCA*, EPA approved an enforceable commitment in the Houston ozone SIP to adopt and implement unspecified NO_x controls on a fixed schedule to achieve aggregate

emission reductions. Petitioners claimed that EPA lacked authority under the CAA to approve a SIP containing an enforceable commitment to adopt unspecified control measures in the future. The court disagreed and found that section 110(k)(4) conditional approvals do not supplant EPA's practice of fully approving enforceable commitments:

Nothing in the CAA speaks directly to enforceable commitments. The CAA does, however, provide EPA with great flexibility in approving SIPs. A SIP may contain "enforceable emission limitations and other control measures, means, or techniques . . . as well as schedules and timetables for compliance, as may be necessary or appropriate" to meet the CAA's requirements. . . . Thus, according to the plain language of the statute, SIPs may contain "means," "techniques" and/or "schedules and timetables for compliance" that the EPA considers "appropriate" for attainment so long as they are "enforceable." *See id.* § 7410(a)(2)(A). "Schedules and timetables" is broadly defined as "a schedule of required measures including an enforceable sequence of actions or operations leading to compliance with an emission limitation, prohibition or standard." 42 U.S.C. § 7602(p). The remaining terms are not defined by the Act. Because the statute is silent on the issue of whether enforceable commitments are appropriate means, techniques, or schedules for attainment, EPA's interpretation allowing limited use of an enforceable commitment in the Houston SIP must be upheld if reasonable.

BCCA at 839-840. The court upheld EPA's approval of the commitment, finding that "EPA reasonably concluded that an enforceable commitment to adopt additional control measures on a fixed schedule was an 'appropriate' means, technique, or schedule or timetable for compliance" under sections 110(a)(2)(A) and 172(c)(6). *Id.* at 841. Thus the court recognized that sections 110(a)(2)(A) and 172(c)(6) provide a basis for EPA to approve enforceable commitments as distinct from the commitments contemplated by section 110(k)(4), which are not in fact enforceable but instead lead to SIP disapproval if not honored. *See also Environmental Defense v. EPA*, 369 F.3d 193, 209-210 (2nd Cir. 2004) (similarly upholding enforceable SIP commitments). As a result, contrary to Earthjustice's contention, section 110(k)(4) is not a bar to EPA's approval of CARB's and the District's enforceable commitments and that approval under section 110(k)(3) is permissible as an appropriate means, technique or schedule or timetable for compliance under sections 110(a)(2)(A) and 172(c)(6).

Comment: Earthjustice states that the commitments are "absurd" because CARB may claim credit toward its aggregate commitments from everything from new regulations to unenforceable incentive programs to "actual decreases occurring in any air basin for which emission reduction commitments have been made." Earthjustice states this is arbitrary and that EPA needs to explain how the commitments offered in the plan would be enforced, what relief EPA or the public could demand, and when a suit could be brought. Earthjustice states that it does not see how these open-ended commitments are practically enforceable in a court of law and asserts that EPA must lay out a roadmap that can be followed by courts in the future to ensure that meaningful emission reductions are achieved.

Response: As discussed in our amended proposal (76 FR 41338, 41355), the CAA allows approval of enforceable commitments that are limited in scope where circumstances warrant the use of such commitments in place of adopted control measures. Commitments approved by EPA under section 110(k)(3) of the CAA are enforceable by EPA and citizens under, respectively,

sections 113 and 304 of the CAA. In the past, EPA has approved enforceable commitments and courts have enforced these actions against states that failed to comply with those commitments: *See, e.g., American Lung Ass'n of N.J. v. Kean*, 670 F. Supp. 1285 (D.N.J. 1987), *aff'd*, 871 F.2d 319 (3rd Cir. 1989); *NRDC, Inc. v. N.Y. State Dept. of Env. Cons.*, 668 F. Supp. 848 (S.D.N.Y. 1987); *Citizens for a Better Env't v. Deukmejian*, 731 F. Supp. 1448, *recon. granted in par*, 746 F. Supp. 976 (N.D. Cal. 1990); *Coalition for Clean Air v. South Coast Air Quality Mgt. Dist.*, No. CV 97-6916-HLH, (C.D. Cal. Aug. 27, 1999). *See* 76 FR 41338, 41355, n. 27.

In response to Earthjustice's comment, we are clarifying in this final action that we are not providing SIP credit for "actual decreases" in air pollution emissions or "recession-related reductions" in approving the 2008 PM_{2.5} Plan. Rather, we are approving the 2008 PM_{2.5} Plan taking into account CARB's revisions to the control strategy based on the revisions to its projected baseline inventories.

Specifically, as explained in our 2011 proposal, CARB's aggregate emissions reduction commitment in the 2008 PM_{2.5} Plan as submitted in 2008 is to achieve 76 tpd of NO_x reductions and 5 tpd of PM_{2.5} reductions by 2014. *See* 76 FR 41338, 41346; CARB Resolution 07-28, Attachment B at pp. 3-6 and 2009 State Strategy Status Report, p. 20.⁹¹ The District's aggregate emissions reduction commitment in the Plan as submitted in 2008 is to achieve 8.97 tpd of NO_x reductions, 6.7 tpd of PM_{2.5} reductions, and 0.92 tpd of SO₂ reductions by 2014. *See* 76 FR 41338, 41345, Table 3. More broadly, however, CARB's emissions reduction commitment is to achieve the "total emissions reductions necessary to attain Federal standards" through "the implementation of control measures; the expenditure of local, State, or federal incentive funds; or through other enforceable measures." *See* CARB Resolution 07-28, Attachment B at pp. 3-6. The updates and improvements to the projected baseline inventories as presented in CARB's 2011 Progress Report altered the calculation of the reductions needed for attainment of the 1997 PM_{2.5} standards in SJV by reducing the total reductions needed from control strategy measures to 9 tpd (for PM_{2.5}), 26.1 tpd (for NO_x), and 0.8 tpd (for SO₂). *See* 76 FR 41338, 41354, Table 7. We therefore interpret CARB's emissions reduction commitment, together with the adjustments to the 2014 baseline inventories provided in CARB's 2011 SIP revision and the District's commitments, as adjusting CARB's total emission reduction commitment such that the CARB is now obligated to achieve 2.3 tpd of PM_{2.5} reductions and 17.1 tpd of NO_x reductions⁹² by 2014 through enforceable control measures to provide for attainment of the 1997 PM_{2.5} NAAQS in SJV. The District's aggregate emissions reduction commitment in the Plan as submitted in 2008 (8.97 tpd of NO_x reductions, 6.7 tpd of PM_{2.5} reductions, and 0.92 tpd of SO₂ reductions by 2014) remains unchanged. *See* Table III-2 below.

We also note that we do not agree with CARB's position that "actual decreases occurring in any air basin for which emission reduction commitments have been made" or incentive programs may be counted as SIP credit toward CARB's enforceable commitment, unless the State provides a demonstration that such emission decreases are enforceable or otherwise meet EPA's criteria for SIP creditability.

⁹¹ In our proposed rule (76 FR 41338, 41346) we reference the 2007 State Strategy, p. 63 and CARB Resolution 07-28, Attachment B, p.6. Note that page 63 of the 2007 State Strategy was replaced with information in the 2009 State Strategy Status Report, pp. 20-21

⁹² Note that the District has already achieved all of the SO_x reductions necessary to attain. *See* 76 FR 41338, 41354, Table 8.

Table III-2 SJV's PM_{2.5} the Attainment Demonstration (tons per average annual day in 2014)				
		Direct PM _{2.5}	NO _x	SO ₂
A	Adjusted 2014 baseline emissions level	72.3	317.3	25.4
B	2014 attainment target level	63.3	291.2	24.6
C	Reductions needed from control strategy measures (A-B)	9.0	26.1	0.8
D	District commitments	6.7	9.0	0.9
E	CARB commitments (C-D)	2.3	17.1	--

CARB's commitment is to adopt and implement measures that will achieve specific reductions of NO_x and PM_{2.5} emissions and are, as such, specific strategies designed to achieve the SIP's overall objectives. Further, if CARB fails to meet its commitments, EPA could make a finding of failure to implement the SIP under CAA Section 179(a), which starts an 18-month period for the State to correct the non-implementation before mandatory sanctions are imposed, or alternatively either EPA or citizens could enforce the commitments directly against CARB under CAA section 113 or 304, respectively.

Comment: Earthjustice states that courts "may only enforce SIP strategies" and that "[m]ere approval of an aspirational goal or non-specific promise into the SIP does not convert that goal or promise into an enforceable commitment." In support of these assertions, Earthjustice cites *Bayview Hunters Point Community Advocates v. Metropolitan Transp. Comm'n*, 366 F.3d 692, 701 (9th Cir. 2004) and *Citizens for a Better Environment v. Metropolitan Transp. Comm'n*, 746 F. Supp. 976, 980 (N.D.Cal. 1990) [known as CBE II]. In addition, Earthjustice singles out *El Comite Para El Bienstar de Earlimart v. Warmerdam*, 539 F.3d 1062, 1067 (9th Cir. 2008), stating that in *El Comite* the court explained that because an inventory in a SIP is not a "standard or limitation" as defined by the CAA, it was not an independently enforceable aspect of the SIP. Thus, Earthjustice reasons, in order to be enforceable, not only must a state's commitment to adopt additional measures to attain emission standards be specific and announced in plain language, but any data or rubric that will be used to determine when and how the state will adopt those measures must be enforceable.

Similarly, citing *Bayview* and *El Comite*, AIR characterizes CARB's and the District's commitments to achieve aggregate emission reductions by the attainment year as "global commitments" that could be interpreted as "goals" unenforceable by citizens under Ninth Circuit precedent, rather than enforceable "strategies" to achieve those goals. AIR argues that the plans' global commitments are not enforceable for two reasons. First, enforcement is not practical because it is virtually impossible for citizens or EPA to determine whether the CARB and the District have, in fact, met the global commitments. Second, the manner in which CARB and the

District determine compliance with the tonnage target is left to their discretion, and citizens and EPA would be placed in the situation held by the plaintiffs in *Warmerdam*.

AIR adds that even if the commitments are viewed as “strategies” enforcement is not practical because when no measures are submitted to EPA for inclusion into the SIP, citizens have no idea which measures CARB has used to satisfy the total tonnage commitments. AIR also states that there are no provisions for CARB and the District to report to EPA and the public what actions they have taken to comply with the tonnage commitments. EPA and citizens are left to determine, based on information collected by CARB and the District, whether the commitments have in fact been met.

Response: Under CAA section 110(a)(2)(A), SIPs must include enforceable emission limitations and other control measures, means or techniques necessary to meet the requirements of the Act, as well as timetables for compliance. Similarly, section 172(c)(6) provides that nonattainment area SIPs must include enforceable emission limitations and such other control measures, means or techniques “as may be necessary or appropriate to provide for attainment” of the NAAQS by the applicable attainment date.

Control measures, including commitments in SIPs, are enforced directly by EPA under CAA section 113 and also through CAA section 304(a) which provides for citizen suits to be brought against any person who is alleged “to be in violation of ... an emission standard or limitation...” “Emission standard or limitation” is defined in subsection (f) of section 304. As observed in *Conservation Law Foundation, Inc. v. James Busey et al.*, 79 F.3d 1250, 1258 (1st Cir. 1996):

Courts interpreting citizen suit jurisdiction have largely focused on whether the particular standard or requirement plaintiffs sought to enforce was sufficiently specific. Thus, interpreting citizen suit jurisdiction as limited to claims “for violations of specific provisions of the act or specific provisions of an applicable implementation plan,” the Second Circuit held that suits can be brought to enforce specific measures, strategies, or commitments designed to ensure compliance with the NAAQS, but not to enforce the NAAQS directly. *See, e.g., Wilder, 854 F.2d at 613-14*. Courts have repeatedly applied this test as the linchpin of citizen suit jurisdiction. *See, e.g., Coalition Against Columbus Ctr. v. City of New York*, 967 F.2d 764, 769-71 (2d Cir. 1992); *Cate v. Transcontinental Gas Pipe Line Corp.*, 904 F. Supp. 526, 530-32 (W.D. Va. 1995); *Citizens for a Better Env't v. Deukmejian*, 731 F. Supp. 1448, 1454-59 (N.D. Cal.), modified, 746 F. Supp. 976 (1990).

Thus courts have found that the citizen suit provision cannot be used to enforce the aspirational goal of attaining the NAAQS, but can be used to enforce specific strategies to achieve that goal, including enforceable commitments to develop future emissions controls.

We describe CARB’s and the District’s commitments in the 2007 State Strategy (revised in 2009 and 2011) and the 2008 PM_{2.5} Plan in detail in our 2011 proposal. *See* 76 FR 41338, 41343-41347. The 2007 State Strategy includes commitments to propose defined new measures and an enforceable commitment for emissions reductions sufficient, in combination with existing measures and the District’s commitments, to attain the PM_{2.5} NAAQS in the SJV by April 5, 2015. *See* CARB Resolution 07-28, Attachment B at pp. 3-6 and 2009 State Strategy Status

Report, p. 21. For the SJV, CARB's emissions reductions commitments as submitted in 2008 were to achieve 76 tpd NO_x and 5 tpd of direct PM_{2.5} by 2014. *Id.*

SJVUAPCD's commitments as submitted in 2008 were to achieve 9 tpd NO_x and 6.7 tpd direct PM_{2.5} by 2014. *See* 76 FR 41338, 41345-41346, *See also* 2008 PM_{2.5} Plan, p. 6-9, Table 6-2. The language used in the Board's resolution adopting the 2008 PM_{2.5} Plan at page 5 to describe its commitment is mandatory and unequivocal in nature:

9. The District Governing Board *commits to adopt and implement* the rules and measures in the 2008 PM_{2.5} Plan by the dates specified in Chapter 6 *to achieve the emissions reductions shown in Chapter 6*, and to submit these rules and measures to the ARB within one month of adoption for transmittal to EPA as a revision to the State Implementation Plan. If the total emission reductions from the adopted rules are less than those committed to in the Plan, the District Governing Board *commits to adopt, submit, and implement* substitute rules and measures that will achieve equivalent reductions in emissions of direct PM_{2.5} or PM_{2.5} precursors in the same adoption and implementation timeframes or in the timeframes needed to meet CAA milestones. (Emphasis added).

SJVUAPCD Board Resolution No. 08-04-10, p. 5.

As discussed above, the 2011 SIP revisions reduced the reductions needed from new measures in 2014 to attain to 9 tpd of PM_{2.5} reductions, 26.1 tpd of NO_x reductions, and 0.8 tpd of SO_x. *See* 76 FR 41338, 41354, Table 7. The District's aggregate emissions reduction commitment in the Plan as submitted in 2008 remains unchanged (8.97 tpd of NO_x reductions, 6.7 tpd of PM_{2.5} reductions, and 0.92 tpd of SO₂ reductions⁹³ by 2014). Thus, the CARB remains obligated to achieve through the adoption of enforceable measures by 2014, 2.3 tpd of PM_{2.5} and 17.1 tpd of NO_x. The District's commitments remain as submitted in 2008 at 9 tpd NO_x, 6.7 tpd direct PM_{2.5} and 0.9 tpd SO_x by 2014. *See* Table III-2 above.

Thus, CARB's and the District's commitments here are to adopt and implement measures that will achieve specific amounts of NO_x and direct PM_{2.5} emission reductions by 2014. These are not mere aspirational goals to ultimately achieve the standards or emission inventories as mentioned by Earthjustice. Rather, the State and District have committed to adopt enforceable measures no later than 2014 that will achieve these specific amounts of emission reductions prior to the attainment date of April 5, 2015. All of these control measures are subject to State and local rulemaking procedures and public participation requirements, through which EPA and the public may track the State/District's progress in achieving the requisite emission reductions. EPA and citizens may enforce these commitments under CAA sections 113 and 304(a), respectively, should the State/District fail to adopt measures that achieve the requisite amounts of emission reductions by the beginning of 2014. *See* 40 CFR § 51.1007(b) (requiring implementation of all control measures needed for expeditious attainment no later than the beginning of the year prior to the attainment date). We conclude that these enforceable commitments to adopt and implement additional control measures to achieve aggregate emission reductions on a fixed schedule are appropriate means, techniques, or schedules for compliance under sections 110(a)(2)(A) and 172(c)(6) of the Act.

⁹³ Note that the District has already achieved all of the SO_x reductions necessary to attain. *See* 76 FR 41338, 41354, Table 8.

Both Earthjustice and AIR cite *Bayview* as support for their contention that the plan's commitments are unenforceable aspirational goals. *Bayview* does not, however, provide any such support. That case involved a provision of the 1982 Bay Area 1-hour ozone SIP, known as TCM 2, which states in pertinent part:

Support post-1983 improvements identified in transit operator's 5-year plans, after consultation with the operators adopt ridership increase target for 1983-1987.

EMISSION REDUCTION ESTIMATES: These emission reduction estimates are predicated on a 15% ridership increase. The actual target would be determined after consultation with the transit operators.

Following a table listing these estimates, TCM 2 provided that "[r]idership increases would come from productivity improvements...."

Ultimately the 15 percent ridership estimate was adopted by the Metropolitan Transportation Commission (MTC), the implementing agency, as the actual target. Plaintiffs subsequently attempted to enforce the 15 percent ridership increase. The court found that the 15 percent ridership increase was an unenforceable estimate or goal. In reaching that conclusion, the court considered multiple factors, including the plain language of TCM 2 (e.g., "[a]greeing to establish a ridership 'target' is simply not the same as promising to attain that target," *Bayview* at 698); the logic of TCM 2, *i.e.*, the drafters of TCM 2 were careful not to characterize any given increase as an obligation because the TCM was contingent on a number of factors beyond MTC's control, *id.* at 699; and the fact that TCM 2 was an extension of TCM 1 that had as an enforceable strategy the improvement of transit services, specifically through productivity improvements in transit operators' five-year plans, *id.* at 701. As a result of all of these factors, the Ninth Circuit found that TCM 2 clearly designated the productivity improvements as the only enforceable strategy. *Id.* at 703.

The commitments in the 2007 State Strategy (revised in 2009 and 2011) and 2008 PM_{2.5} Plan are in stark contrast to the ridership target that was deemed unenforceable in *Bayview*. The language in CARB's and the District's commitments, as stated multiple times in multiple documents, is specific; the intent of the commitments is clear; and the strategy of adopting measures to achieve the required reductions is completely within CARB's and the District's control. Furthermore, as stated previously, CARB and the District identify specific emission reductions that they will achieve, how they could be achieved and the time by which these reductions will be achieved, *i.e.*, by 2014.

Earthjustice also cites *CBE II* at 980 for the proposition that courts can only enforce "express" or "specific" strategies. However, as discussed below, there is nothing in the *CBE* cases that supports the commenter's view that the CARB and District commitments are neither express nor specific. In fact, these cases support our interpretation of CARB's and the District's commitments.

Citizens for a Better Environment v. Deukmejian, 731 F.Supp.1448 (N.D. Cal. 1990), known as *CBE I*, concerned in part contingency measures for the transportation sector in the 1982 Bay Area 1-hour ozone SIP. The provision states: "If a determination is made that RFP is not being met for the transportation sector, MTC will adopt additional TCMs within 6 months of the determination. These TCMs will be designed to bring the region back within the RFP line."

The court found that “[o]n its face, this language is both specific and mandatory.” *Id.* at 1458. In *CBE I*, CARB and MTC argued that TCM 2 could not constitute an enforceable strategy because the provision fails to specify exactly what TCMs must be adopted. The court rejected this argument, finding that “[w]e discern no principled basis, consistent with the Clean Air Act, for disregarding this unequivocal commitment simply because the particulars of the contingency measures are not provided. Thus we hold that the basic commitment to adopt and implement additional measures, should the identified conditions occur, constitutes a specific strategy, fully enforceable in a citizen’s action, although the exact contours of those measures are not spelled out.” *Id.* at 1457.⁹⁴ In concluding that the transportation and stationary source contingency provisions were enforceable, the court stated: “Thus, while this Court is not empowered to enforce the Plan’s overall objectives [footnote omitted; attainment of the NAAQS]--or NAAQS--directly, it can and indeed, must, enforce specific strategies committed to in the Plan.” *Id.* at 1454.

Earthjustice’s reliance on *CBE II* is misplaced. It also involves in part the contingency measures in the 1982 Bay Area Plan. In *CBE II*, defendants argued that RFP and the NAAQS are coincident because, had the plan’s projections been accurate, then achieving RFP would have resulted in attainment of the NAAQS. The court rejected this argument, stating that:

the Court would be enforcing the *contingency plan*, an express strategy for attaining NAAQS. Although enforcement of this strategy might possibly result in attainment, it is distinct from simply ordering that NAAQS be achieved without anchoring that order on any specified strategy. Plainly, the fact that a specified strategy might be successful and lead to attainment does not render that strategy unenforceable.

(Emphasis in original). *CBE II* at 980.

CARB’s and the District’s commitments here are analogous to the terms of the contingency measures in the *CBE* cases. CARB and the District commit to adopt measures, which are not specifically identified, to achieve a specific tonnage of emission reductions. Thus, the commitment to a specific tonnage reduction is comparable to a commitment to achieve RFP. Similarly, a commitment to achieve a specific amount of emission reductions through adoption and implementation of unidentified measures is comparable to the commitments to adopt unspecified TCMs and stationary source measures. The key is that commitment must be clear in terms of what is required, e.g., a specified amount of emission reductions or the achievement of a specified amount of progress (i.e., RFP). CARB’s and the District’s commitments are thus clearly a specific enforceable strategy rather than an unenforceable aspirational goal.

Earthjustice’s reliance on *El Comite* is also misplaced. The plaintiffs in the district court attempted to enforce a provision of the 1994 California 1-hour ozone SIP known as the Pesticide Element. The Pesticide Element relied on an inventory of pesticide VOC emissions to provide the basis to determine whether additional regulatory measures would be needed to meet the SIP’s pesticides emissions target. To this end, the Pesticide Element provided that “ARB will develop a baseline inventory of estimated 1990 pesticidal VOC emissions based on 1991 pesticide use

⁹⁴ In this passage, the court was referring specifically to the stationary source contingency measures in the Bay Area plan which contained a commitment to adopt such measures if emission targets were not met. The 2008 PM_{2.5} Plan identified a number of potential stationary sources but did not commit to any particular one. In discussing the transportation contingency measures, the court applied this same reasoning. *Id.* at 1456-1457.

data....” *El Comite Para El Bienestar de Earlimart v. Helliker*, 416 F. Supp. 2d 912, 925 (E.D. Cal. 2006). CARB subsequently employed a different methodology that it deemed more accurate to calculate the baseline inventory. The plaintiffs sought to enforce the commitment to use the original methodology, claiming that the calculation of the baseline inventory constitutes an “emission standard or limitation.” The district court disagreed:

By its own terms, the baseline identifies emission sources and then quantifies the amount of emissions attributed to those sources. As defendants argue, once the sources of air pollution are identified, control strategies can then be formulated to control emissions entering the air from those sources. From all the above, I must conclude that the baseline is not an emission “standard” or “limitation” within the meaning of 42 U.S.C. § 7604 (f)(1)-(4).

Id. at 928. In its opinion, the court distinguished *Bayview* and *CBE I*, pointing out that in those cases “the measures at issue were designed to reduce emissions.” *Id.*

On appeal, the plaintiffs shifted their argument to claim that the baseline inventory and the calculation methodology were necessary elements of the overall enforceable commitment to reduce emissions in nonattainment areas. The Ninth Circuit agreed with the district court’s conclusion that the baseline inventory was not an emission standard or limitation and rejected plaintiffs’ arguments attempting “to transform the baseline inventory into an enforceable emission standard or limitation by bootstrapping it to the commitment to decide to adopt regulations, if necessary.” *Id.* at 1073.

While Earthjustice cites the Ninth Circuit’s *El Comite* opinion, its utility in analyzing the CARB and District commitments here is limited to that court’s agreement with the district court’s conclusion that neither the baseline nor the methodology qualifies as an independently enforceable aspect of the SIP. Rather, it is the district court’s opinion, in distinguishing the commitments in *CBE* and *Bayview*, that provides insight into the situation at issue in our action. As the court recognized, a baseline inventory or the methodology used to calculate it, is not a measure to reduce emissions. It instead “identifies emission sources and then quantifies the amount of emissions attributed to those sources.” In contrast, as stated previously, in the 2007 State Strategy (revised 2009 and 2011) and SJV 2007 PM_{2.5} Plan, CARB and the District commits to adopt and implement measures sufficient to achieve specified emission reductions by a date certain. As described above, a number of courts have found commitments substantially similar to CARB’s here to be enforceable under CAA section 304(a).

Comment: Earthjustice comments that before EPA can approve the commitments in the PM_{2.5} plan it must explain how the promise to reduce emissions by some amount is a “standard or limitation” enforceable under section 113 or 304 of the Act. Moreover, citing CAA section 110(a)(2)(A), Earthjustice asserts that EPA must explain how enforcement of these commitments, which arguably could not even be considered until after the attainment deadline has come and gone, is adequate to assure the requirements of the Act (including timely attainment) are met. Earthjustice contends that the strategy of relying on these open-ended commitments is a recipe for failure and is not a reasonable substitute for the detailed, enforceable plan envisioned and required by the Act.

Response: We disagree. As discussed above, EPA believes that CARB’s and the District’s commitments to adopt and implement control measures to achieve the specified aggregate

tonnage by 2014 are enforceable as an emission standard or limitation under CAA section 304. The fact that the State may meet its SIP obligation by adopting measures that are not specifically identified in the SIP, or through one of several available techniques, does not render the requirement to achieve the aggregate emission reductions unenforceable. State and local control measures are subject to rulemaking procedures and public participation requirements, through which EPA and the public may track the State/District's progress in achieving the requisite emission reductions in the years leading up to 2014 and before the attainment date of April 5, 2015.. Should the State/District fail to adopt measures that achieve the requisite amounts of emission reductions by the beginning of 2014 (*see* 40 CFR § 51.1007(b)), EPA and citizens may enforce these commitments under CAA sections 113 and 304(a), respectively.

Comment: The District and CARB commented that they have adopted all feasible measures and for areas such as the SJV, a higher percentage of enforceable commitments should be allowed. They argue that 30 percent can be a "limited" amount given their circumstances and that EPA's 10 percent level is arbitrary. They also argue that EPA has not explained why 30 percent is excessive especially given that the reductions are coming from already adopted rules (the in-use off-road equipment and in-use truck rule). Finally, they argue that it is illogical for EPA to state that the State/District are capable of fulfilling its commitments (i.e., satisfy prong 2) but that the size of the commitments is too high to approve and that it is incongruous for EPA to commend the State/District on their rulemaking schedules, stating that they are reasonable and appropriate, and then to find that they do not meet the appropriate timeframe (i.e., third prong) of the commitments criteria.

Response: The question of whether 30 percent constituted a limited amount of commitments is now moot given the revised commitment is now in the 10 percent range.

Our rationale for proposing to find that the commitments did not meet the third factor (reasonable and appropriate period of time) was due to the fact that we were not proposing to extend the attainment date to April 5, 2015 in our 2010 proposal; however, as discussed in our 2011 proposal and above we are now approving the extension and finding that the commitments are for a reasonable and appropriate period of time.

Comment: The District comments that there is no requirement that measures must be EPA approved before the SIP can be approved. They also comment that it is unfair to hold them having approximately 90 percent of their emissions reductions adopted and approved by EPA and compare them to Houston because Houston's SIP was approved seven years after it was due to EPA and SJV's PM_{2.5} SIP was only submitted 2.5 years ago.

Response: As discussed above, CAA section 110(a)(2)(A) requires that SIPs include enforceable emission limitations and other control measures, means or techniques necessary to meet the requirements of the Act, as well as timetables for compliance. Similarly, section 172(c)(6) provides that nonattainment area SIPs must include enforceable emission limitations and such other control measures, means or techniques "as may be necessary or appropriate to provide for attainment" of the NAAQS by the applicable attainment date. The timing of a State's submittal or EPA's action on that submittal does not alter these substantive requirements of the Act. We discussed in responses to comments above our reasons for approving the 2008 PM_{2.5} Plan based in part on the limited amount of needed emission reductions that remain as enforceable commitments, consistent with EPA's past practice.

3. Other Control Strategy Comments

Comment: Earthjustice comments that EPA cannot credit the SO_x reductions associated with Rule 4320 (AERO for boilers) without first collecting and providing the public a chance to review documentation of the sources that have installed controls and the pre- and post-modification emissions from these sources and should also determine that these reductions are surplus and have not been used for emissions reductions offsets.

Response: The commenter provides no specific grounds for rejecting the District's estimates of SO_x and PM_{2.5} emissions reductions from Rule 4320 or documenting that the reductions have been used as offsets. EPA generally does not require pre- and post-control testing of sources before crediting emissions reductions from a rule in an attainment demonstration. We agree that any emissions reductions used as offsets must be surplus.

We note that even if we excluded the current estimates of 1.92 tpd of SO_x from the Rule in 2014, we would still conclude that the District had met its SO_x commitment. The District committed to achieving 0.9 tpd of SO_x and, if reductions from Rule 4320 are excluded, has achieved 1.7 tpd. *See* TSD, Tables F-2 and F-4. We also note that if we excluded the current estimate of 0.24 tpd of PM_{2.5}, we would still conclude that the District had met its SO_x commitment and the percent of needed reductions remaining as commitments was reasonable.

Comment: Mr. Unger commented that there should be extra control measures for ultrafine particulate matter (PM with a diameter of 0.1 microns) given that particles of this size can go from the alveolar sacs into the blood vessels and it is therefore likely that these small particles harm humans in different ways than bigger fine particles.

Response: EPA currently does not have a NAAQS for ultrafine particulate. In April, 2011 EPA released its final "Policy Assessment for the Review of the Particulate Matter National Ambient Air Quality Standards," ("2011 PM Policy Assessment") which presents EPA staff's conclusions regarding the adequacy of the current suite of PM standards as well as potential alternative standards. In preparing this policy assessment, EPA reviewed the latest scientific studies on particulate matter health effects, including the health effects of ultrafine particles, and concluded that there is insufficient information at this time to consider adding a specific standard for ultrafine particles. *See* 2011 PM Policy Assessment, pp. 2-49 to 2-52.

F. Attainment Date Extension

Comment: Earthjustice comments that EPA cannot grant an extension of the attainment date to April 5, 2015 because the flaws Earthjustice alleges are in the 2008 PM_{2.5} Plan's attainment modeling and RACM/RACT analysis meant that the demonstration required to grant a 5-year extension have not been met. Earthjustice asserts that the alleged flaws include the exemptions for significant sources of emissions from the charbroiling, glass melting and open burning rules; the delay in the implementation of certain control requirements (glass melting and agricultural equipment), and the exclusion of controls for VOC and condensable PM_{2.5} emissions in the Plan

Response: We have evaluated Earthjustice's comments on the RACM/RACT analysis, VOC as an attainment plan precursor, and condensable particulate and have determined that none change our conclusion that the SJV 2008 PM_{2.5} Plan provides for RACM as required by CAA section 172(c)(1).

Under the PM_{2.5} implementation rule, states that request an extension of the attainment date under CAA section 172(a)(2) must provide sufficient information to show that attainment by April 5, 2010 is impracticable due to the severity of the nonattainment problem in the area and the lack of available and feasible control measures to provide for faster attainment. *See* 40 CFR 51.1004(b). States must also demonstrate that all RACM and RACT for the area are being implemented to bring about attainment of the standards by the most expeditious alternative date practicable for the area. 72 FR 20586, 20601. As discussed in our 2011 proposal, we believe that California has met the relevant tests for granting an extension of the attainment date under CAA section 172(a)(2). *See* 76 FR 41388, 41341.

Comment: The District comments that the five-year attainment date extension should not automatically be denied because the attainment demonstration is not approvable. EPA should consider conditional approval. The extension of the attainment date is crucial to allow for development of technology, rule development and mobile fleet turnover.

Response: The PM_{2.5} implementation rule requires that EPA act on an attainment date extension and attainment demonstration at the same time. *See* 40 CFR § 51.1004(b). Since EPA is now approving the attainment demonstration and attainment date extension, we do not need to address the District's request that we consider a conditional approval under CAA section 110(k)(4). Finally, we have concluded that the extension of the attainment date to April 5, 2015 is necessary given the severity of nonattainment and the availability and feasibility of pollution control measures.

Comment: Mr. Unger commented that to a pregnant SJV woman, a PM_{2.5} attainment date of April 5, 2015 must seem very distant and that date means her child's lungs will be exposed to PM_{2.5} in their most formative years.

Response: For the reasons discussed in our proposals and further in response to comments above, EPA is concluding that the most expeditious date for attainment of the 1997 PM_{2.5} standards in the SJV is April 5, 2015. *See* 76 FR 41338, 41335. We note that many areas of the Valley are expected to have ambient PM_{2.5} levels below the standards before then.

G. Attainment Demonstration

Comment: Earthjustice comments that EPA should not approve the attainment demonstration, because of its "heavy" reliance on State commitments to adopt last-minute control measures and because the emissions reductions and the attainment targets are not valid given the problems in the inventory and the modeling analysis. Furthermore, the defective modeling results in inaccurate attainment target levels.

Response: The SJV 2008 PM_{2.5} SIP does not rely heavily on State commitment to "adopt last-minute controls." As noted previously, the bulk of the emissions reductions needed for attainment are from measures adopted prior to 2007. 76 FR 41338, 41354. Moreover, one of EPA's criteria for approving attainment demonstrations that rely on commitments is that the commitments represent a limited portion of the reductions needed for attainment. As we have shown, CARB's and the District's remaining commitments account for only 4.5 percent (12.9 tpd) of the NO_x and 13.2 percent (3.0 tpd) of the PM_{2.5} reductions needed for attainment. *Id.* In comparison, the State has already achieved 271 tpd of NO_x and 19.7 tpd of PM_{2.5}. *See* 76 FR

41338, 41354 (Table 8) (numbers are the sum of lines B and C). Finally, we have determined that the SJV PM_{2.5} Plan provides for generally linear reduction in emissions demonstrating reasonable further progress as required by CAA 172(c)(2).

H. Reasonable Further Progress

Comment: In its August 2011 letter, Earthjustice comments that EPA should disapprove the RFP demonstration because it fails to address VOC and to show generally linear progress in reducing emissions. It also argues that because of the alleged defects in the inventory and the alleged failure of the modeling analysis to identify the target level of emission reductions, it is impossible to assess progress. It further argues that the RFP demonstration must also be updated to reflect corrections to the inventory.

Response: For the reasons discussed in the proposal and response to comments on the precursor issue, EPA has found that insufficient data exist to reverse the presumption in the PM_{2.5} implementation rule that VOC is not a PM_{2.5} attainment plan precursor for attainment of the 1997 PM_{2.5} standards in the SJV. *See* 76 FR 41338, 41350 and 2011 Proposal TSD, p. 50. Because VOC is not considered an attainment plan precursor, it need not be addressed in the RFP demonstration. *See* 40 CFR § 51.1009(c).

For the reasons discussed in the proposal and response to comments on the air quality modeling, EPA has found that the air quality modeling in the SJV 2007 PM_{2.5} SIP is adequate to support the attainment demonstration and thus to establish the target level of emissions. As discussed in the proposal, EPA evaluated the effect of the changes in the base year inventory on the RFP demonstration and determined that it did not revise our conclusion that the Plan provided for RFP. *See* 76 FR 41338, 41348 and 2011 Proposal TSD, section II.B.

Comment: In its January 2011 letter, Earthjustice agreed with EPA's 2010 proposed disapproval of the RFP demonstration. It also argued that defects it alleged existed in the inventory meant that it was not possible to assess RFP. It concluded that RFP demonstration must also be updated to reflect corrections to the inventory.

Response: California has updated the RFP demonstration to reflect changes to the future year inventories. *See* 2011 Progress Report, Appendix C and 76 FR 41338, 41356. For the reason described in 2011 proposal, EPA has determined that the revised RFP demonstration meets the requirement for RFP in CAA section 172(c)(2). EPA evaluated the effect of the changes in the base year inventory on the RFP demonstration and determined that it did not revise our conclusion that the Plan provided for RFP. *See* 76 FR 41338, 41357 (fn. 32) and 2011 Proposal TSD, p. 122.

Comment: In response to EPA's initial proposed disapproval of the RFP demonstration, the SJVUAPCD maintained that the RFP demonstration should be approved because it was implementing its rules as expeditiously as practicable and has made steady progress in reducing emissions. It also stated that it was investigating an alternative analysis approach to showing to show how the SJV 2008 PM_{2.5} SIP meets EPA's "milestone date fraction" analysis.

Response: CARB submitted a revised RFP demonstration for the SJV in Appendix C of the 2011 Progress Report. EPA proposed to approve that demonstration in our 2011 proposal as and

we are concluding that it meets the applicable requirements of the CAA and the PM_{2.5} implementation rule. *See* 76 FR 41338, 41357.

I. Contingency Measures

Comment: In its August 2011 letter, Earthjustice states that EPA's analysis of the contingency measures in the 2008 Plan is generally sound. Earthjustice, however, contends that our analysis relies on an RFP analysis that in turn relies on invalid NO_x to PM_{2.5} interpollutant equivalency ratios. It further argues that because these ratios are invalid, the assessment of the excess reductions in the RFP demonstration is also invalid and the shortfall targets must be recalculated using valid methods and results.

Response: EPA's calculation of the excess reductions in the RFP demonstration is done on a per pollutant basis and does not assume any interpollutant trading. *See* 76 FR 41338, 41359 (Table 10) and 2011 Proposal TSD, p. 130. In the 2011 Progress Report, CARB states that these reductions are equal to at least one-year's worth of RFP when considered on a PM_{2.5} equivalency basis (*See* 2011 Progress Report, p. 2); however, to make this statement, the State relies in part on an interpollutant trading ratio of 1 ton of SO_x reductions to 1 ton of PM_{2.5} reductions. As discussed in section II.B.4. of the 2011 Proposal TSD, EPA found that there was insufficient technical support for this ratio and EPA did not allow its use in the RFP demonstration or for any other purpose. *Id.* at 42358 and p. 129.

Comment: In its January 31, 2011 comments, Earthjustice notes that the District proposes to rely on emission reductions achieved by the ozone nonattainment fee and other incentive programs. It argues that the District does not have criteria for how these monies will be spent and does not provide a mechanism for ensuring that any claimed emission reductions are enforceable and that any future reliance on funding programs to reduce emissions must demonstrate that the emission reductions meet statutory creditability requirements including an explanation of how these agreements between the District and the subsidized source can be enforced by EPA or the public.

Response: We are not approving reductions from the District's incentive grant programs as part of the 2008 PM_{2.5} SIP's contingency measures provisions; therefore, comments related to them are not germane to this action. In both its 2010 and 2011 proposals EPA proposed to disapprove the Plan's contingency measures provisions and is disapproving those provisions in today's action. *See* 75 FR 74518, 74539 and 76 FR 41338, 41358. Those provisions include the District's ozone nonattainment fee program and other incentive programs as potential contingency measures.

In both proposals, we noted that while neither the CAA nor EPA policy bar the use of emissions reductions from incentive programs to meet all or part of an area's contingency measure obligation, the incentive programs must assure that the reductions are surplus, quantifiable, enforceable, and permanent in accordance with EPA's guidance. *See* "Improving Air Quality with Economic Incentive Programs," EPA-452/R-01-001 (January 2001). We also noted that the 2008 PM_{2.5} Plan does not identify the incentive grant programs expected to generate the emissions reductions. The Plan also does not identify the quantity of these emissions reductions that the District intended to use to meet the contingency measure requirement. Therefore, we are unable to determine if they are SIP creditable or sufficient to provide in combination with other measures the roughly one-year's worth of RFP needed. For these

reasons, we determined that programs did not currently meet the CAA requirements for contingency measures. *See* 75 FR 74518, 74538 and 76 FR 41338, 41358.

Comment: While AIR agrees with EPA's proposed disapproval of the contingency measures, it argues against the use of waiver measures and on-road fleet turnover as contingency measures because waiver measures are not in the SIP and there are no control measures that require fleet turnover. It further argues that reductions from fleet turnover are derived from assumptions based on voluntary future activity that fail to meet the Act's requirements for enforceable measures. Finally, it asserts that EPA has made no finding that such fleet turnover reductions have actually occurred.

Response: As discussed previously, we believe that reductions from CAA section 209 waiver measures can be used to meet CAA requirements including the contingency measure requirement even though they are not in the SIP.

The measures relied on in part for contingency measure emission reductions are the State and federal on- and off-road new engines standards. Fleet turnover is the mechanism by which these new engine standards are implemented, and it is how these standards actually result in emissions reductions in an area. CARB calculates reductions from its mobile sources, including base year and future projected year, using its EMFAC2007 and OFFROAD models. These models included assumptions regarding fleet turnover based on historical records.⁹⁵ Recent updates to the truck inventories included review and adjustments of fleet turnover rates which are also based on available records. *See* 2010 Truck Rule ISOR, section F.

Comment: SJVUACPD commented that EPA's current requirement that contingency measures provide for one-year's worth of emissions reductions is not practical for areas like the SJV and that EPA should work towards realistic and specific solutions for future implementation rules. It also stated that it would continue to work with EPA to incorporate reductions from the District's incentive programs into the SIP so that they may be used satisfy the contingency measures requirement.

Response: EPA recognizes the difficulty of identifying contingency measures and appreciates the District's concerns. We will continue to work with the District to identify potential contingency measures including incentive programs that produce reductions that are surplus, quantifiable, enforceable, and permanent in accordance with EPA guidance.

J. Motor Vehicle Emissions Budgets

Comment: Earthjustice comments that EPA cannot approve the revised motor vehicle emissions budgets because they are derived from attainment and RFP demonstrations that Earthjustice asserts are not approvable because they are based on invalid modeling. It also claims the issues with the modeling also affect the conformity analysis because it depends on interpollutant equivalency ratio between NO_x and PM_{2.5} that is derived from the modeling. Earthjustice notes that CARB derived this ratio by conducting a sensitivity analysis with the model which

⁹⁵ *See* CARB, "Public Meeting to Consider Approval of Revisions to the State's On-Road Motor Vehicle Emissions Inventory, Technical Support Document," May 2000, section 7.3 "Retention Rates" which can be found at http://www.arb.ca.gov/msei/onroad/doctable_test.htm.

according to Earthjustice, EPA acknowledged was not a legitimate basis for determining interpollutant equivalency ratios, citing the 2011 Proposal TSD at p. 47. Earthjustice further claims that these “defective ratios” were used to demonstrate RFP and conformity.

Response: We agree with Earthjustice that EPA would not be able to approve budgets that are derived from unapprovable or disapproved attainment or RFP demonstrations. However, as described in our 2011 proposal and TSD, we are approving these demonstrations in the SJV 2008 PM_{2.5} Plan and, because they are derived from these demonstrations and meet all other applicable requirements for transportation conformity budgets, EPA is also approving the budgets. For the reasons discussed above in our response to comments on the air quality modeling, we do not agree with Earthjustice that the modeling is invalid.

CARB included a trading mechanism to be used in transportation conformity analyses that use the proposed budgets as allowed for under 40 CFR § 93.124. This trading mechanism allows future decreases in NO_x emissions from on-road mobile sources to offset any on-road increases in PM_{2.5}, using a NO_x:PM_{2.5} ratio of 9:1. As proposed by CARB and proposed for approval by EPA, the trading mechanism would only be used, if needed, for conformity analyses for years after 2014. Also, to ensure that the trading mechanism does not impact the ability of the SJV to meet the NO_x budget, the NO_x emissions reductions available to supplement the PM_{2.5} budget would only be those remaining after the 2014 NO_x budget has been met. *See* 2011 Progress Report, Appendix D, p. 2 and 76 FR 41338, 41361. We found that the method CARB used to derive the 9:1 NO_x to PM_{2.5} ratio, which was based on the SIP’s photochemical modeling, is adequate for purposes of assessing the effect of area-wide emissions changes, such as are used in RFP, contingency measures, and conformity budgets. *See* 76 FR 41338, 41349 and 2011 Proposal TSD, p.46.

EPA did find that the method used by CARB and the District (a modified rollback approach) to derive the 1:1 SO_x to PM_{2.5} is inadequate for determining interpollutant equivalency ratios and stated that this issue would be better explored with a photochemical model. *See* 76 FR 41338, 41349 and 2011 Proposal TSD, p.47. It is this latter discussion that Earthjustice incorrectly cites as its basis for claiming that EPA rejected the interpollutant trading ratio used in establishing the trading mechanism for transportation conformity analyses. The 2008 PM_{2.5} SIP does not establish motor vehicle emissions budgets for SO₂ and therefore does not establish an SO₂:PM_{2.5} trading mechanism for transportation conformity purposes.

We note again that, contrary to Earthjustice’s claim, CARB did not rely on interpollutant trading to demonstrate RFP, and therefore EPA did not propose to approve and is not approving the RFP demonstration based on any interpollutant trading. *See* 2011 Progress Report, Appendix C, p. 1 and 76 FR 41338, 41357.⁹⁶

Comment: Earthjustice claims that a transportation agency cannot rely on budgets derived from what it considers to be the unapprovable SJV2008 PM_{2.5} SIP without violating CAA section 176(c)(1) because they would not be able to assure that their actions would not interfere with timely attainment or reasonable further progress.

⁹⁶ CARB did reserve excess SO_x reductions in the RFP demonstration to provide for direct PM_{2.5} contingency measures. *See* 2011 Progress Report, Appendix A, p. 2. EPA rejected this approach. *See* 76 FR 41338, 41358.

Response: As documented in this TSD and our 2011 proposed rule, EPA has found that the SJV 2008 PM_{2.5} SIP demonstrates reasonable further progress and expeditious attainment of the 1997 PM_{2.5} standards consistent with the requirements of the CAA and EPA's implementing regulations. We have also concluded that the budgets in this SIP are consistent with these demonstrations and are both adequate and approvable. Therefore, the SJV MPOs must use these budgets in their transportation conformity determinations.

K. Miscellaneous Comments

Comment: AIR claims that EPA fails to list the 2009 State Strategy Status Report (pages 11-23) among the documents which it proposes to include as part of the SIP, citing 76 FR 41338, 41361, and that this is an error given CARB's intent in the 2009 State Strategy Status Report (citing p. 11). AIR requests that EPA clarify its intent to approve a CARB commitment for staff to propose a rule to regulate in-use mobile agricultural equipment. AIR notes that this commitment was part of the 2007 State Strategy (citing CARB Resolution 07-28, Attachment B, p. 7), included in the 2009 State Strategy Status Report, and was a component of EPA's previous proposed approval of the 2007 State Strategy (citing 75 FR 74518, 74541 (November 30, 2011)), but is not included in the updated rulemaking schedule in 2011 Progress Report.

Response: EPA lists the 2009 State Strategy Status Report as one of five submittals that comprise the 2007 PM_{2.5} SIP for the SJV. *See* 76 FR 41338, 41340. We also state in section VI. (EPA's proposed Actions and Potential Consequences) that we were proposing to approve the SJV portions of CARB's 2007 State Strategy as revised in 2009 and 2011 addressing CAA and EPA regulations for attainment of the 1997 PM_{2.5} NAAQS in the SJV. We specifically proposed to approve CARB's commitments to propose certain defined measures as listed in Table B-1 on page 1 of Appendix B of the 2011 Progress Report submittal based on CARB's own characterization of that submittal as its updates to its rulemaking schedule for the PM_{2.5} measures in the 2007 State Strategy. *See* 2011 Progress Report, p. 8, Table 1.

On June 20, 2011 CARB noticed proposed revisions to the ozone portions of the 2007 State Strategy including revisions to the rulemaking schedule for in-use agricultural equipment. *See* CARB, Notice of Public Hearing to Consider a Status Report on the State Strategy for California's 2007 State Implementation Plan and Consider Approval of Proposed Revisions for the 8-Hour Ozone and Minor Technical Revisions to the PM_{2.5} SIP Transportation Conformity Budgets," June 20, 2011. As stated in the proposed revisions, CARB does not consider the in-use agricultural measures to be part of its PM_{2.5} control strategy and therefore did not include updates to the schedule for that measure in its PM_{2.5} SIP revision.⁹⁷ *See* 2011 Ozone SIP Revisions, p. 3. These revisions were adopted by the Board on July 21, 2011, submitted to EPA on July 29, 2011 and proposed for approval by EPA on September 16, 2011 at 76 FR 57846. This proposed approval includes the revised schedule for the in-use agricultural equipment measure. *See* 76 FR 57846, 57853.⁹⁸

⁹⁷ As discussed previous, CARB provided emissions reductions estimates for the in-use agricultural equipment measure only for 2017, which is three years after the 2014 attainment year for PM_{2.5}.

⁹⁸ AIR notes that Table F-8 in EPA's 2011 Proposal TSD lists the agricultural equipment rule as a defined measure in the 2011 Progress Report. This was an error and has been corrected in the final TSD.

Comment: AIR requests clarification from EPA on whether the omission of the proposed commitment in the 2011 Progress Report is an administrative error, or whether CARB intentionally removed that commitment from the 2007 State Strategy. AIR notes that based on CARB's website, it appears that the omission was in error, because CARB continues to represent to the public that it is working on the in-use agricultural equipment rule. AIR asserts, to the extent that CARB intentionally removed the commitment, such action violates 40 C.F.R. § 51.102 because CARB did not provide adequate notice to the public of this fundamental change to CARB's strategy and that the public should not be expected to search through "voluminous SIP-related material, searching out stealth amendments by omission."

Response: As required by 40 CFR 51.102, CARB posted the draft 2011 Progress Report including the proposed revisions to the rulemaking schedule in the 2007 State Strategy 30 days prior to the public hearing and requested public comments. *See* CARB, Notice of Public Hearing to Consider the Approval of a Progress Report and Proposed State Implementation Plan Revisions for PM_{2.5}, March 29, 2011. Questions and comments on the State's proposed revisions to its rulemaking schedule, including changes to the in-use agricultural equipment measure, should be directed to CARB during the State's public comment periods or at the public hearings.

CARB's lists its entire rulemaking schedule for the State Strategy on prominently labeled tables on page 65 of the 2007 State Strategy, on page 23 of the 2009 State Strategy Status Report, and in Appendix B of the 2011 Progress Report. All three of these documents are readily available to the public on CARB's website.

Comment: AIR comments that the 2008 PM_{2.5} Plan and the 2007 State Strategy fail to demonstrate a monitoring program for CARB mobile source measures and the pesticide regulation, stating EPA regulations specifically require each plan to make this demonstration, citing 40 CFR § 51.111. It provides as an example, CARB's anti-idling rules.

Response: EPA's regulation at 40 CFR § 51.111 requires each plan include a description of enforcement methods including, but not limited to, procedures for monitoring compliance with each of the selected control measures and procedures for handling violations. These requirements apply to the control measures that are in the SIP. For the reasons discussed previously, we do not believe that California's mobile source measures that receive waivers under CAA section 209 need to be submitted for inclusion into the SIP; therefore, California need not include a description of the enforcement and or monitoring program for these measures in its SIP.⁹⁹ As noted previously, CARB's anti-idling regulations are pending a section 209 waiver decision. Should any of these provisions need to be submitted for SIP approval, we will evaluate their monitoring procedures at the time we take action to incorporate them into the SIP. As we have also noted previously, the pesticide regulation is not part of the 2008 PM_{2.5} SIP's control strategy; therefore, the lack of any monitoring procedures is not material to our approval of this SIP.

As a practical matter, to be effective, monitoring procedures (which includes monitoring and recordkeeping requirements and testing procedures) must be tailored to the specific emissions limitation for which they are to be used. For example, the procedures for monitoring NO_x emissions from utility boilers are very different from the procedures for monitoring the

⁹⁹ For a description of CARB's source monitoring and enforcement programs including its procedures for handling violations, *See* <http://www.arb.ca.gov/enf/enf.htm>.

VOC content of paints. Compare, for example, Rule 4601 (Boilers > 5 million BTU per hour), sections 5.4 “Monitoring Requirements” and 6.0 “Administrative Requirements” requiring continuous emissions monitoring and annual source testing using specific test procedures to Rule 4601 (Architectural Coatings), section 6.0 “Administrative Requirements” specifying label requirements, requiring maintenance of annual sales records, and specifying test methods for determining the VOC content of coatings. Because of the need to tailor monitoring procedures to the emissions limit, EPA evaluates a prohibitory rule’s monitoring, recordkeeping, and testing procedures at the time it reviews the rule for incorporation into the SIP. We note that we are not approving any rules or regulations as part of this specific action on the SJV 2008 PM_{2.5} SIP.

Comment: Petitions with signatures from hundreds of SJV and Ventura residents submitted in support of AIR’s comment letter also called on EPA to protect the petitioners’ health and the health of their families by ensuring that the SJV PM_{2.5} Plan met all applicable requirements under the Clean Air Act so that the petitioners could “force the Air Resources Board and the Air District to fulfill what they promised” to have air quality that meets the 1997 PM_{2.5} standards no later than April 5, 2015. Petitioners state that given “the failures by ARB and the Air District to meet the 1-hour ozone standards of the Clean Air Act,” EPA must ensure that the 1997 PM_{2.5} standards are timely attained.

Response: We have fully responded to all of AIR’s comments above. We believe that the SJV 2008 PM_{2.5} SIP meets all applicable requirements of the CAA and will provide for air quality that meets the 1997 PM_{2.5} standards by April 5, 2015.

Comment: Mr. Unger commented that he wished EPA would lobby SJV City Councils and County Boards of Supervisors when they consider sprawling housing projects, fossil fuel burning facilities including gasification and spending money on roads rather than transit.

Response: EPA has long supported smart growth principles and has some limited authority, for example under the National Environmental Protection Act, to suggest alternatives to projects when federal funding is used. In addition, we ensure through our CAA permitting authority that new or modified facilities burning fossil fuels are well controlled. However, we lack the authority to ban the use of fossil fuels.

Appendix A – CARB Rules and Measures

A. Complete List of State Measures

Appendix Table A-1 is a list of all measures adopted by CARB from 1990 until the end of 2006. This period covers the 18 years prior to the development of the 2007 State Strategy and the SJV 2008 PM_{2.5} Plan. The table should include any substantive rules that would still be generating emissions reductions in the San Joaquin Valley during the 2005-2014 period covered by the Plan and thus reflected in the baseline for the Plan.

This list does not include the limits on pesticide emissions adopted by the California Department of Pesticide Regulation nor the State's inspection and maintenance program adopted by the California Bureau of Automotive Repair.

Measures that are categorized as Not Applicable are either solely administrative (e.g., permit fees, state ambient air quality standards), do not address particulate matter or a PM_{2.5} attainment plan precursor in the SJV (e.g., asbestos air toxic control measure), or otherwise do not affect emissions in the SJV (e.g., test methods).

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Antiperspirant/Deodorants. . T 17, CCR, 94500-94506	11/09/89	Consumer products
Transported Pollutants (Ozone). . T 17, CCR, 70500	12/04/89	Not applicable
Emission Control System Warranty. . T 13, CCR, 2035-2041, 1977	12/14/89	On-road
Non-vehicular Test Methods. . T 17, CCR, 94002, 94003 17, &26, 94146-94149, 94132, 94135, 94139, 94140	01/11/90	Not applicable
Certification Procedure for Aftermarket Parts. VC 27156 & 38391	02/08/90	On-road
Airborne Toxic Control Measure for Asbestos in Surfacing Applications. . T 17, & 26, CCR, 93106	04/12/90	Not applicable
Test Method for Asbestos in Serpentine Aggregate. . T 17, & 26, CCR, 94147, Method 435	04/12/90	Not applicable
Air Toxics "Hot Spots" Fee Regulation. . T 17, & 26, CCR, 90700-90704, 93300-93347	05/10/90	Not applicable
Airborne Air Toxic Measure for Ethylene Oxide from Sterilizers & Aerators. . T 17, CCR, 93108	05/10/90	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Permit Fee Regulations for Non-vehicular Sources. . T 17, CCR, 90800.1, 90800, 90802-90803	05/10/90	Not applicable
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. . T 17, & 26, CCR, 93300-93347	06/14/90	Not applicable
Consumer Products Regulations for the BAAQMD. . T 17, CCR, 94520-94526	06/14/90	Consumer products
Criteria for Area Designations for the State Ambient Air Quality Standard. . T 17, CCR, 70303 & 70304	06/14/90	Not applicable
Emission Standards for Medium Duty Vehicles. . T 13, CCR, 1900, 1956.8, 1960.1, 1968.1, 2061, 2112, 2139	06/14/90	On-road
Wintertime Limits for Sulfur in Diesel Fuel. . T 13, CCR, 2255	06/21/90	Fuels
Dioxins Airborne Toxic Control Measure for Medical Waste Incinerators. . T 17, CCR, 93104	07/12/90	Not applicable
Emissions Reduction Accounting Procedures for California Clean Air Act. . T 17, CCR, 70700-70704	07/12/90	Not applicable
Identification of Inorganic Arsenic as a Toxic Air Contaminant. . T 17, & 26, CCR, 93000	07/12/90	Not applicable
Evaporative Emission Standards. . T 13, CCR, 1976	08/09/90	On-road
Transport Mitigation Regulations. . T 17, CCR, 70600-70601	08/09/90	Not applicable
Air Toxic Fee Schedule & Emissions Inventory Criteria and Guidelines. . T 17, & 26, CCR, 90700-90704, 93300-93347	09/13/90	Not applicable
California Reformulated Gasoline (CaRFG), Phase I. . T 13, CCR, 2251.5	09/27/90	Fuels
Low Emission Vehicles and Clean Fuels. . T 13, CCR, 1900, 1904, 1956.8, 1960.1, 1960.1.5, 1960.5 and 2111, 2112, 2125, and 2139, 2061.	09/28/90	On-road
Identification of Trichloroethylene as a Toxic Air Contaminant. . T 17, & 26, CCR, 93000	10/11/90	Not applicable
Phase I - Consumer Products. . T 17, CCR, 94507-94517	10/11/90	Consumer products

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Controls for Abrasive Blasting. . T 17, CCR, 92000, 92200, 92400, 98500, 98510, 92520, 92530	11/08/90	Not applicable
Heavy Duty Diesel Smoke Emission Testing. . T 13, CCR, 2180-2187	11/08/90	On-road
Revision to Designation Criteria. . T 17, CCR, 60200-60204, 60208	11/08/90	Not applicable
Identification of Vinyl Chloride as a Toxic Air Contaminant. . T 17, & 26, CCR, 93000	11/13/90	Not applicable
Conflict of Interest Code. . T 17, CCR, 95001, et. seq.	12/13/90	Not applicable
Emission Standards for Utility and Lawn and Garden Engines. . T 17, CCR, 2400 et. seq.	12/13/90	Off-road
Identification of Chloroform as a Toxic Air Contaminant. . T 17, & 26, CCR, 93000	12/13/90	Not applicable
Limit on Aromatic Content of Diesel Fuel. . T 13, CCR, 2256	12/13/90	Fuels
Permit Fee Regulations for Non-vehicular Sources. . T 17, CCR, 90800.2, 90801, 90803	02/24/91	Not applicable
Acid Deposition Fee Regulations. . T 17, CCR, 90621.2, 90620, 90622	04/11/91	Not applicable
Non -Vehicular Test Methods. . T 17, CCR, 94131, 94132, 94142	04/11/91	Not applicable
Administrative Hearing Procedures. . T 17, CCR, 60075.1, 60075.47	05/09/91	Not applicable
Air Toxics "Hot Spots" Fee Regulation. . T 17, & 26, CCR, 90700 - 90705	06/13/91	Not applicable
Agricultural Burning Guidelines. T 17, 80130, 80150, 80250, 80260, 80290	07/11/91	Not applicable
Identification of Metallic & Inorganic Nickel Compounds as a Toxic Air Contaminant. T 17, & 26, 93000	08/08/91	Not applicable
Onboard Diagnostics for Light-Duty Trucks and Light & Medium-Duty Motor Vehicles. T 13, CCR, 1977, 1968.1	09/12/91	On-road
Identification of Perchloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/10/91	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
State Ambient Air Quality Standard for SO ₂ . T 17, CCR, 70100, 70200, 70201	10/10/91	Not applicable
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1, 1977	11/12/91	On-road
Area Designations. T 17, CCR, 60200, 60209	11/14/91	Not applicable
Low Emission Vehicles amendments revising reactivity adjustment factor (RAF) provisions and adopting a RAF for M85 transitional low emission vehicles. T 13, CCR, 1960.1	11/14/91	On-road
California Reformulated Gasoline, Phase II. T 13, CCR, 2250, 2255.1, 2252, 2260 - 2272, 2295	11/21/91	Fuels
Wintertime Gasoline Program. T 13, CCR, 2258, 2298, 2251.5, 2296	11/21/91	Fuels
Specifications for Alternative Motor Vehicle Fuel. T 13, & 26, CCR, 2290, 2291, 2292.1, 2292.2, 2292.3, 2292.5, 2292.6, 2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	12/12/91	Fuels
Heavy Duty Diesel Cycle Engines. T 13, CCR, 2420-2427	01/09/92	Off-road
Phase II - Consumer Products. T 17, CCR, 94501, 94502, 94505, 94514, 94503.5, 94506, 94507 - 94513, 94515	01/09/92	Consumer products
Identification of Formaldehyde as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	03/12/92	Not applicable
Specifications for Alternative Motor Vehicle Fuels. T 13, & 26, CCR, 2290-2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	03/12/92	On-road
Atmospheric Acidity Protection Fees. T 17, CCR, 90621.3	04/09/92	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.3, 90803	04/09/92	Not applicable
Criteria for Area Designations. T 17, CCR, 70303, 70304	05/14/92	Not applicable
Standards and Test Procedures for Alternative Fuel Retrofit Systems. T 13, CCR, 2030, 2031	05/14/92	On-road
Transported Air Pollutants. T 17, CCR, 70500	05/28/92	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90701, 90704, 90705	07/09/92	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Identification of 1,3 Butadiene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/09/92	Not applicable
Phase 2 RFG certification fuel specifications. T 13, CCR, 1960.1, 1956.8(d)	08/13/92	On-road
CFC Refrigerants in Air Conditioning Systems. T 13, CCR, 2500	09/10/92	Not applicable
Substitute Fuel or Clean Fuel Incorporated Test Procedures. T 13, CCR, 1960.1(k), 2317	11/12/92	On-road
Notice of General Public Interest for Consumer Products. T 17, CCR, 94507 - 94517	11/30/92	Consumer products
Airborne Toxic Control Measure for Emission of Toxic Metals from Non-Ferrous Metal Melting. T 17, & 26, CCR, 93107	12/10/92	Not applicable
Criteria for Area Designations. T 17, CCR, 70303.5, 60200-60203, 60205, 70303	12/10/92	Not applicable
Smoke Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	12/10/92	On-road
Certification Requirements for Low Emission Passenger Cars, Light-Duty Trucks & Medium Duty Vehicles. T 13, CCR, 1960.1, 1976, 2061, 1900	01/14/93	On-road
Transport Mitigation Regulations. T 17, CCR, 70600, 70601	03/11/93	Not applicable
1-year Implementation Delay in Emission Standards for Utility Engines. T 13, CCR, 2400, 2403-2407	04/08/93	Off-road
Acid Deposition Fee Regulations. T 17, CCR, 90622, 90621.4	04/08/93	Not applicable
Identification of Federal Hazardous Air Pollutants as Toxic Air Contaminants. T 17, & 26, CCR, 93001, 39665, 39666	04/08/93	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.4, 90803	04/08/93	Not applicable
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/10/93	Not applicable
Urban Transit Buses. T 13, CCR, 1956.8, 1965, 2112	06/10/93	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/08/93	Not applicable
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1	07/09/93	On-road
Mitigation Transport Pollutants. T 17, CCR, 70500, 70600	08/12/93	Not applicable
Wintertime Oxygenate Program. T 13, CCR, 2258, 2251.5, 2263(b), 2267, 2298, 2259, 2283, 2293.5	09/09/93	Fuels
Airborne Toxic Control Measure for Perchloroethylene Dry Cleaning. T 17, & 26, CCR, 93109, 93110	10/14/93	Not applicable
Diesel Fuel Regulations - Emergency. T 13, CCR, 2281(h), 2282(1)	10/15/93	Fuels
Conflict of Interest. T 17, CCR, 90500	11/18/93	Not applicable
Criteria for Area Designations. T 17, CCR, 60200-60202, 60204, 60206, 60208, 70300-70306	11/18/93	Not applicable
Off-Highway Recreational Vehicles. T 13, CCR, 2410-2414, 2111-2140	01/03/94	Off-road
Evaporative Emission Standards and Test Procedures. T 13, CCR, 1976	02/10/94	On-road
SCAQMD's Reclaim Consideration	03/10/94	Not applicable
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.5, 90803	04/14/94	Not applicable
Predictive Model for Phase II CaRFG. T 13, CCR, 2261, 2262-2270	06/09/94	Fuels
Small Refiner Diesel. T 13, CCR, 2282(e)(1)	07/24/94	Fuels
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/28/94	Not applicable
Utility and Lawn and Garden Equipment Engines. T 13, CCR, 2403(c), 11(a)(1)(I)(ii), 4(a)(1)(I)(ii)	07/28/94	Off-road
Alternative Control Plan for Consumer Products. T 17, CCR, 94540-94555	09/22/94	Consumer products
Diesel Fuel Certification. T 13, CCR, 1956.8(b)&(d), 1960.1(k), 2292.6	09/22/94	Fuels
Area Designations. T 17, CCR, 60201, 60204	11/09/94	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	11/09/94	On-road
Onboard Diagnostics, Phase II. T 13, CCR, 1963.1, & Certification Procedures	12/08/94	On-road
Periodic Smoke Inspection Program. T 13, CCR, 2190	12/08/94	On-road
Specification for Alternative Motor Vehicle Fuels (M100). T 13 CCR, 2292.1	12/08/94	Fuels
Aerosol Coating Products and Alternative Control Plan. T 17, CCR, 94520-94528, 94540-94543, 94547.	03/23/95	Consumer products
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.6, 90803	04/27/95	Not applicable
Employee-Based Trip Reductions Emission Formula. T 13, CCR, 2330, 2331, 2332	06/29/95	Not applicable
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015, 94150-94160, 94000-94004, 94007.	06/29/95	Vapor Recovery
Heavy Duty Vehicle Exhaust Emission Standards. T 13, CCR, 1956.8 and incorporate test procedures.	06/29/95	On-road
Onboard Refueling Vapor Recovery Standards. T 13, CCR, 1976, 1978 and incorporate test procedures	06/29/95	On-road
Test Method for Oxygen in Gasoline. T 13, CCR, 2251.5(c), 2258(c), 2263(b)	06/29/95	Fuels
Retrofit Emission Standards. T 13, CCR, 1956.9, 2030, 2031, and incorporate test procedures	07/27/95	On-road
Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products. T 17, CCR, 94500-94506, 94508, 94521	09/28/95	Consumer products
Low Emission Vehicle Standards 3 (LEV 3). T 13, CCR, 1956.8, 1960.1, 1965, 2101, 2061, 2062, and incorporate test procedures	09/28/95	On-road
Test Methods for CaRFG 13, CCR, 2263(b)	10/26/95	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Required Additives in Gasoline (Deposit Control Additives). T 13, CCR, 2257 and incorporates testing procedures.	11/16/95	Fuels
CaRFG Housekeeping & CARBOB. T 13, CCR, 2263.7, 2266.5, 2260, 2262.5, 2264, 2265, 2272	12/14/95	Fuels
Exemption of Military Tactical Vehicles. T 13, CCR, 1905, 2400, 2420	12/14/95	On Road/Off Road
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705 and Appendix A	01/25/96	Not applicable
CaRFG Variance Requirements. T 13, CCR, 2271 (Emergency)	01/25/96	Fuels
Relaxation of Carbon Monoxide Emission Standards for Utility Engines. T 13, CCR, 2403 and incorporating test procedures	01/25/96	Off-road
Postpone Zero Emission Vehicle Requirements. T 13, CCR, 1900, 1960.1, 1976	03/28/96	On-road
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90803, 90800.7	04/25/96	Not applicable
Basin Boundaries for Agricultural Burning (Mojave Desert, South Coast & Salton Sea). T 17, CCR, 60104, 60109, 60114, 80280, 80311	05/30/96	Not applicable
Regulation Improvement and Repeal. T 17, CCR, 93301-93355, Appendix A-E (emissions inventory)	05/30/96	Not applicable
Regulation Improvements and Repeals (fuel additives). T 13, CCR, 2201, 2202	05/30/96	Fuels
Emissions Inventory Criteria & Guideline Report. T 17, CCR, 93300.5	07/25/96	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90701-90705 Appendix A to §§ 90700-90705	09/26/96	Not applicable
Stationary Source Test Methods. T 17, CCR, 94105, 94107, 94114, 94135, 94141, 94143, 94161	09/26/96	Not applicable
Wintertime Requirements for Utility Engines & Off-Highway Vehicles. T 13, CCR, 2403	09/26/96	Off-road
Diesel Fuel Certification Test Methods . T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Fuels
Diesel Fuel Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Antiperspirants and Deodorants, Consumer Products, Aerosol Coating Products (ARB Test Method 310). T 17, CCR, 94506(a), 94515(a), 94526	11/21/96	Consumer products
Area Designations. T 17, CCR, 60201-60209	11/21/96	Not applicable
Consumer Products and Aerosol Coating Products Amendments. T 17, CCR, 94508-94515, 99517, 94321	11/21/96	Consumer products
Transport Pollutants. T 17, CCR, 70500, 70600	11/21/96	Not applicable
Onboard Diagnostics, Phase II, Technical Status. T 13, CCR, 1968.1, 2030, 2031	12/12/96	On-road
Consumer Products (Hair Spray) Amendments. T 17, CCR, 94509, 94513, 94514	03/27/97	Consumer products
Liquefied Petroleum Gas Propane Limit Specification Delay. T 13, CCR, 2292.6	03/27/97	Fuels
Portable Equipment Registration Program. T 13, CCR, 2450-2465	03/27/97	Off-road
Identification of Inorganic Lead as Toxic Air Contaminant (TAC). T 17, CCR, 93000	04/24/97	Not applicable
Interchangeable Emissions Reduction Credits. T 17, CCR, 91500	05/22/97	Not applicable
Postpone Enhanced Evaporative Emission Requirements for Ultra-Small Volume Vehicle Manufacturers. T 13, CCR, 1976 and incorporate test procedures	05/22/97	On-road
Consumer Products (Mid-Term Measures) Amendments. T 17, CCR, 94508, 94509, 94513	07/24/97	Consumer products
Off-Cycle Emissions Supplemental Federal Test Procedures (SFTPs). T 13, CCR, 1960.1, 2101 and incorporate test procedures	07/24/97	On-road
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR 90701-90705 and Appendix A	11/13/97	Not applicable
Area Designations. T 17, CCR, 60201 & 60205	11/13/97	Not applicable
Consumer Products (Hairspray Credit Program). T 17, CCR, 94502, 94509, 94522, & 94548	11/13/97	Consumer products
Heavy Duty Vehicle Smoke Inspection Program/Periodic Smoke Inspection Program. T 13, CCR, 2180-2188 and 2190-2194	12/11/97	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR 90800	01/29/98	Not applicable
Small Off-Road Engines (SORE). T 13, CCR, 2400, 2410-2414	03/26/98	Off-road
Classifying Minor Violations. T 17, CCR, 60090-60095	04/23/98	Not applicable
Heavy Duty Vehicle Regulations: 2004 Standards. T 13, CCR, 1956.8, 1965, 2036, 2112 and test procedures	04/23/98	On-road
Airborne Toxic Control Measure for Chrome Plating. T 17, CCR, 93102	05/21/98	Not applicable
Cleaner Burning Gasoline Model Flexibility. T 13, CCR, Sections 2260, 2262.1, 2262.3, 2262.4, 2262.5, 2262.6, 2262.7 and 2265	08/27/98	Fuels
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015 and 94150, 94156, 94157, 94158, 94159, 94160, 94162	08/27/98	Vapor Recovery
Identification of Diesel Exhaust as a Toxic Air Contaminant. T 17, CCR, 93000	08/27/98	Not applicable
Gasoline Deposit Control Additive Regulation. T 13, CCR, 2257, and incorporating test procedures	09/24/98	Fuels
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90701-90705 and Appendix A	10/22/98	Not applicable
Area Designations and Criteria for the National and State Ambient Air Quality Standards for Ozone. T 17, CCR, 60301, 60202, 60205, 60206, 70300-70306, 70303.1	10/22/98	Not applicable
Large Off-Road Spark-Ignition Engine Regulations. T 13, CCR, 2430 et seq., and 2411-2414	10/22/98	Off-road
Stationary Source Test Methods. T 17, CCR, 94101 - 94104, 94106, 94108 - 94113, 941T 17 - 94124, 94137 and revision of Method 12.	10/22/98	Not applicable
Low Emission Vehicles Standards (LEV 2) and Compliance Assurance Program (CAP 2000). T 13, CCR, 1961 & 1962 (both new); 1900, 1960.1, 1965, 1968.1, 1976, 1978, 2037, 2038, 2062, 2101, 2106, 2107, 2110, 2112, 2114, 2119, 2130, 2137-2140, 2143-2148	11/05/98	On-road
Aftermarket Parts for Off-Road Engines. T 13, CCR, 2470-2476	11/19/98	Off-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Consumer Products - LVP-VOC Definitions And Test Methods. T 17, CCR, 94506, 94506.5, 94508(a)(78), 94515 and 94526, and the amendment of ARB Method 310	11/19/98	Consumer products
Consumer Products, Aerosol Coatings & Antiperspirants and Deodorants. T 17, CCR, 94501, 94508, 94521, 94522, and 94524	11/19/98	Consumer products
1997 & Later Model Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2410-2414, 2415	12/10/98	Off-road
Emission Standards and Test Procedures for 2001 Marine Engines. T 13, CCR, 2440 et seq	12/10/98	Off-road
Exhaust Standards for (On-Road) Motorcycles. T 13, CCR, 1958	12/10/98	On-road
Revisions to Statewide Portable Equipment Registration Program. T 13, CCR, 2450-2463	12/10/98	Off-road
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2600-2610	12/10/98	On-road
Cleaner Burning Gasoline (Increasing the Oxygen Content). T 13, CCR, sections 226 _{2.5} (b) and 2265(a)(2)	12/11/98	Fuels
Specifications for Liquid Petroleum Gas Used as a Motor Vehicle Fuel. T 13, CCR, 2292.6	12/11/98	Fuels
Cleaner Burning Gasoline, Oxygen Requirement for Wintertime In Lake Tahoe Area/Gas Pump Labeling for MTBE. T 13, CCR, 226 _{2.5} , and 2273	06/24/99	Fuels
Gasoline Vapor Recovery Systems. T 17, CCR, 94011, 94153, 94155, and incorporated test procedures, CP-201, TP- 201.4, and TP-201.6	06/24/99	Vapor Recovery
Clean Fuels Regulation Requirements. T 13, CCR, sections 2300-2317, and 2303.5, 2311.5	07/22/99	On-road
Portable Container Spillage Control Measure. T 13, CCR, 2470-2478	09/23/99	Off-road
Administrative Hearing Procedures. T 17, CCR, 60040 and 60075.1-60075.45	10/22/99	Not applicable
California Consumer Products Regulation Mid-Term Measures II. T 17, CCR, 94508, 94509, and 94513	10/28/99	Consumer products
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201	11/18/99	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
CaRFG Phase 3 Amendments (Phase out of MTBE, standards, predictive model). T 13, CCR, 2260, 2261, 2262.1, 226 _{2.5} , 2263, 2264, 2264.2, 2265, 2266 etc...	12/09/99	Fuels
Off-Road Compression Ignition Engines. T 13, CCR, 2111, 2112, 2137, 2139, 2140, 2141, 2144, 2400, 2401, 2403, 2420, 2421, 2423-2427, & appendix A to article 2.1.	01/27/00	Off-road
Transit Bus Standards. T 13, CCR, 1956.1, 1956.2, 1956.3, 1956.4, 1956.8, 1965	02/24/00	On-road
Agricultural Burning Guidelines. T 17 Amendments 80145, 80T 179, 80100-80102, 80110, 80120, 80130, 80140, 80150, 80155, 80160, 80T 170, 80180, 80200, 80210, 80230, 80240, 80250, 80260, 80270, 80280, 80290, 80300, 80310, 80311, 80320, 80330	03/23/00	Not applicable
Enhanced Gasoline Vapor Recovery Systems (Emergency Filing CP-201, section 18). T 17, CCR, 94011	03/23/00	Vapor Recovery
Enhanced Gasoline Vapor Recovery Systems (In Station Diagnostics and Onboard Refueling Vapor Recovery). T 17, CCR, 94011	03/23/00	Vapor Recovery
Air Toxic Control Measure for Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Facilities. T 17, CCR, 93111	04/27/00	Other
Consumer Products Aerosol Adhesives Control Measure. T 17, CCR, 94508, 94509, 94512, 94513	05/25/00	Consumer products
Aerosol (Paint) Coatings Products. T 17, CCR, 94700, 94701, 94521-94524, 94526	06/22/00	Consumer products
Air Toxic Control Measure for Asbestos Containing Serpentine. T 17, CCR, 93106	07/20/00	Not applicable
Conflict of Interest Code. T 17, CCR, 95001, 95002, 95005, and subchapter 9	09/28/00	Not applicable
Rice Straw Conditional Burn Permit Program. T 17, CCR, 80101, 80156-80158	09/28/00	Not applicable
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90705 tables 1, 2, 3a, 3b, 3c, and 4	10/26/00	Not applicable
Antiperspirant and Deodorant Regulations. T 17, CCR, 94502, 94504	10/26/00	Consumer products
Area Designations for the State Ambient Air Quality Standard for Ozone. T 17, CCR, 60201	11/16/00	Not applicable

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
CaRFG Phase 3 Follow-up Amendments. T 13, CCR, sections 2260, 2261, 2262.3, 2262.5, 2263, 2264, 2265, 2266, 2266.5, 2270, 2272, 2273, 2282, 2296, 2297, 2262.9 and incorporated test procedures	11/16/00	Fuels
CaRFG Phase 3 Test Methods. T 13, CCR, sections 2263(b)	11/16/00	Fuels
Heavy Duty Diesel Engines "Not-to-Exceed (NTE)" Test Procedures. T 13 CCR, 1956.8, 2065	12/07/00	On-road
Light-and Medium Duty Low Emission Vehicle Alignment with Federal Standards. Exhaust Emission Standards for Heavy Duty Gas Engines. T 13, CCR, 1956.8 & 1961	12/07/00	On-road
Zero Emission Vehicle Regulation Update. T 13, CCR, 1900, 1960.1(k), 1961, 1962 & incorporated Test Procedure	01/25/01	On-road
Ozone Transport Assessment. T 17, CCR, 70500 & 70600	04/26/01	Not applicable
Zero Emission Vehicle Infrastructure and Standardization of Electric Vehicle Charging Equipment. T 13, CCR, 1900(b), 1962(b) 1962.1	06/28/01	On-road
Airborne Toxic Control Measure for Asbestos from Construction, Grading, Quarrying, and Surface Mining. T 17, CCR, 93105	07/26/01	Not applicable
Marine Inboard Engines. T 13, CCR, 2111, 2112, 2139, 2140, 2147, 2440-2442, 2443.1-2443.3, 2444, 2445.1, 2445.2, 2446, 2444.2 and incorporation of documents by reference	07/26/01	Off-road
Air Toxic Control Measures for Auto and Mobile Equip Refinishing Coatings containing Hexavalent Chromium and Cadmium Compounds. T 17, CCR, 93112	09/20/01	Not applicable
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705	10/25/01	Not applicable
Gasoline Vapor Recovery Systems Test Methods and Compliance Procedures. T 17, CCR, 94010, 94011, 94153, 94155, 94163, 94164, 94165 & incorporated procedures	10/25/01	Vapor Recovery
Heavy Duty Diesel Engine Standards for 2007 and Later. T 13, CCR, 1956.8 and incorporated test procedures	10/25/01	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Distributed Generation Guidelines and Regulations. T 17, CCR, 94200-94214	11/15/01	Other
Gasoline Vapor Recovery Systems Defects. T 17, CCR, 94006 and incorporated document.	11/15/01	Vapor Recovery
Low Emission Vehicle Regulations. T 13, CCR, 1960.1, 1960.5, 1961, 1962 and incorporate test procedures and guidelines	11/15/01	On-road
California Motor Vehicle Service Information Rule. T 13&17, CCR, 1969 & 60060.1 - 60060.7	12/13/01	On-road
Airborne Toxic Control Measure for Outdoor Residential Waste Burning. T 17, CCR, 93113	02/21/02	Other
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2601-2605, 2606 & appendices C & D, and 2607-2610	02/21/02	On-road
On-Board Diagnostic II Review Amendments. T 13, CCR, 1968.1, 1968.2, 1968.5	04/25/02	On-road
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements. T 13, CCR, 2700-2710	05/16/02	On-road
Review of California Ambient Air Quality Standards for Particulate Matter and Sulfates. T 17, CCR, 70100, 70200, and 70100.1	06/20/02	Not applicable
CaRFG Phase 3 Amendments. T 13, CCR, 2261, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2266.5, 2269, 2271, 2272, 2265, and 2296	07/25/02	Fuels
Revision to Transit Bus Regulations Amendments. T 13, CCR, 1956.1, 1956.2, 1956.4, 1956.8, and 2112, & documents incorporated by reference	10/24/02	On-road
Administrative Civil Penalties Program. T 17, CCR, 60065.1 - 60065.45 and 60075.1 - 60075.45	12/12/02	Not applicable
Airborne Toxic Control Measure for Diesel Particulate from School Bus Idling. T13, CCR, 2480	12/12/02	On-road
CaRFG Phase 3 Amendments (specifications for De Minimus Levels of Oxygenates and MTBE Phase Out Issues). T 13, CCR, 2261, 2262.6, 2263, 2266.5, 2272, 2273, 2260, 2273.5	12/12/02	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Gasoline Vapor Recovery Systems Test Procedures. T 17, CCR, 94010, 94011, 94163, 94164, and 94165 and procedures incorporated by reference, and 94166, 94167, and incorporation by reference.	12/12/02	Vapor Recovery
Low Emission Vehicles II. Align Heavy Duty Gas Engine Standards with Federal Standards; minor administrative changes. T 13, CCR, 1961, 1965, 1956.8, 1956.1, 1978, 2065 and documents incorporated by reference	12/12/02	On-road
Zero Emission Vehicle Amendments for 2003. T 13, CCR, 1960.1(k), 1961(a) and (d), 1900, 1962, and documents incorporated by reference	03/25/03	On-road
Ozone Transport Mitigation Regulations. T 17, CCR, 70600 and 70601	05/22/03	Not applicable
Off-Highway Recreation Vehicles. T13, CCR, 2415	07/24/03	Off-road
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.75, 90800.9, 90804, 90800.8, 90801, 90802, and 90803	07/24/03	Not applicable
Specifications for Motor Vehicle Diesel Fuel. T 13 & T 17, CCR, 1961, 2281, 2282, 2701, 2284, 2285, 93114, and incorporated test procedure	07/24/03	Fuels
Solid Waste Collection Vehicles. T 13, CCR, 2020, 2021, 2021.1, 2021.2	09/24/03	On-road
Small Off-Road Engines (SORE). T 13, CCR, 2400-2409, 2405.1, 2405.2, 2405.3, 2750-2754, 2754.1, 2754.2, 2755-2767, 2767.1, 2768-2773 and the documents incorporated by reference	09/25/03	Off-road
Revised Tables of Maximum Incremental Reactivity Values. T 1, CCR, 94700.	12/03/03	Consumer products
Airborne Toxic Control Measure for Diesel Particulate for Transport Refrigeration Units. T 13, CCR, 2022 & 2477	12/11/03	On-road
Airborne Toxic Control Measure for Stationary Compression Ignition Engines. T 17, CCR 93115 & documents incorporate by reference	12/11/03	Other
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements (Amendments). T 13, CCR, 2701-2707 & 2709	12/11/03	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Area Designation Criteria and Area Designations for State PM _{2.5} and Ozone Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, 60210	01/22/04	Not applicable
CA Motor Vehicle Service Information Rule. T 13, CCR, 1969	01/22/04	On-road
Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 17, CCR, 93116, 93116.1, 93116.2, 93116.3, 93116.4, and 93116.5	02/26/04	Off-road
Modifications to the Statewide Portable Equipment Registration Program (PERP) Regulations . T 13, CCR Amendments to 2450-2465, and repeal of 2466	02/26/04	Off-road
Heavy Duty Diesel Engine-Chip Reflash. T 13, CCR, 2011, 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194	03/27/04	On-road
Engine Manufacturer Diagnostic System Requirements for 2007 and Subsequent Model Heavy Duty Engines. T 13, CCR, 1971	05/20/04	On-road
Consumer Products & Methods 310/ATCM for Para-Dichlorobenzene. T 17, CCR, 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, and ARB Method 310, which is incorporated by reference	06/24/04	Consumer products
Urban Bus Engines/Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, 1956.3, and 1956.4,	06/24/04	On-road
Airborne Toxic Control Measure for Diesel Particulate from Diesel Fueled Commercial Vehicle Idling. T 13, CCR, 2485	07/22/04	On-road
Gasoline Vapor Recovery Systems at Dispensing Facilities. Emergency Filing. T 17, CCR, 94011	07/22/04	Vapor Recovery
Unihose Gasoline Vapor Recovery Systems. T17, CCR, 94011	07/22/04	Vapor Recovery
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006(b) & incorporated document	08/24/04	Vapor Recovery
Greenhouse Gas. T 13, CCR, 1961.1, 1900, 1961 and Incorporated Test Procedures	09/23/04	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
California Reformulated Gasoline, Phase 3. T 13, CCR, 2260, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2263, 2265 (and the incorporated "California Procedures"), and 2266.5	11/18/04	Fuels
Diesel Fuel Standards for Harbor Craft & Locomotives. T 13, CCR, 2299, 2281, 2282, and 2284, and T 17, CCR, 93117	11/18/04	Fuels
Enhanced Gasoline Vapor Recovery Systems Extension. T 17, CCR, 94011 and certification procedure	11/18/04	Vapor Recovery
Permit Fee Regulations for Non-vehicular Sources. T17, CCR 90805 and 90806; and 90800.8 and 90803	11/18/04	Not applicable
Emergency Regulation for Temporary Delay of Diesel Fuel Lubricity Standard. T 13, CCR, 2284	11/24/04	Fuels
Airborne Toxic Control Measure for Hexavalent Chromium and Nickel from Thermal Spraying. T 17, CCR, 9310 _{2.5}	12/09/04	Not applicable
Off-Road Compression Ignition Engines. T 13, CCR, 2420, 2421, 2423, 2424, 2425, 2427	12/09/04	Off-road
Area Designations. T 17, CCR, 60201, 60202, 60205, 60210	01/20/05	Not applicable
Transit Fleet Rule. T 13, CCR, 2023, 2023.1, 2023.2, 2023.3, 2023.4, 1956.1, 2020, 2021, repeal 1956.2, 1956.3, 1956.4	02/24/05	On-road
State Ambient Air Quality Standard for Ozone. T 17, CCR, 70100, 70100.1, and 70200	04/28/05	Not applicable
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments). T 17, CCR, 93115	05/26/05	Other
Definition of Large Confined Animal Facility. T 17, CCR 86500 and 86501	06/23/05	Not applicable
On-Board Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines (HD OBD). T 13, CCR, 1971.1	07/21/05	On-road
Reid Vapor Pressure Limit. Emergency Rule. T 13, CCR, 2262 and 2262.4	08/08/05	Fuels

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
2007-2009 Model-Year Heavy Duty Urban Bus Engines and the Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, and 1956.8	09/15/05	On-road
Portable Fuel Containers (PFC) [Part 2 of 2]. T 13, CCR 2467.2, 2467.3, 2467.4, 2467.5, 2467.6, 2467.7; repeal of 2467.8, and adoption of new 2467.8 and 2467.9.	09/15/05	Off road
Portable Fuel Containers (PFC) [Part 1 of 2]. T 13, CCR, 2467 and 2467.1	09/15/05	Off road
Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008. T 13, CCR section 1956.8 and the incorporated document	10/20/05	On-road
Airborne Toxic Control Measure for Cruise Ships Onboard Incineration. T 17, CCR, 93119	11/17/05	Off road
Marine Inboard Sterndrive Engines. T 13 CCR 2111, 2112, 2441, 2442, 2444.2, 2445.1, 2446, 2447, and incorporated document	11/17/05	Off-road
Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline. T 13, CCR, 2299.1 and T 17, CCR, 93118	12/08/05	Off-road
Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities. T 13, CCR, 2022 and 2022.1	12/08/05	On-road
Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. T 13, CCR, 2479	12/08/05	Off-road
AB1009 Heavy-Duty Vehicle Smoke Inspection Program. T 13, CCR, 2180, 2180.1, 2181, 2182, 2183, 2184, 2185, 2186, 2187, and 2188, 2189	01/26/06	On-road
Identification of Tobacco Smoke as a Toxic Air Contaminant. T 17, CCR, 93000	01/26/06	Not applicable
Diesel Verification Procedure, Warranty & In-Use. T 13, CCR, 2702, 2703, 2704, 2706, 2707, and 2709.	03/23/06	On-road
Technical Amendments to Evaporative Exhaust and Evaporative Emissions Test Procedures. T 13, CCR, 1961, 1976 and 1978.	05/25/06	On-road

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Fork Lifts and Other Industrial Equipment. (Large Off-Road Spark Ignition Engines > 1 liter) T 13, CCR 2430, 2433, 2434. Adopt 2775, 2775.1, 2775.2, 2780, 2781, 2783, 2784, 2785, 2786, 2787, 2788, and 2789.	05/26/06	Off-road
California Motor Vehicle Service Information Rule. T 13, CCR, 1969 and incorporated documents	06/22/06	On-road
Gasoline Vapor Recovery Systems. T 17 CCR 94011 and incorporated certification	06/22/06	Vapor Recovery
Portable Equipment Registration Program. T 13, CCR, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, and 2465	06/22/06	Off-road
Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2411-2413, 2415 & documents incorporated by reference	07/20/06	Off-road
Heavy-Duty In-Use Compliance Regulation. T 13, CCR, 1956.1, 1956.8, and documents incorporated by reference	09/28/06	On-road
On-Board Diagnostic II. T 13, CCR, 1968.2, 1968.5, 2035, 2037 and 2038	09/28/06	On-road
Distributed Generation Guidelines and Regulations. T 17, CCR, 94201, 94201.1, 94203, 94204, & 94207-942142	10/19/06	Other
Zero Emission Bus Regulation. T13, CCR, 2023.1, 2023.3, & 2023.4	10/19/06	On-road
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, CCR, 93300.5 and document incorporated by reference	11/16/06	Not applicable
Airborne Toxic Control Measure for Cruise Ships and Ocean-Going Ships Onboard Incineration (amendments). T 17, CCR, 93119	11/16/06	Off-road
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments, Agricultural Eng. Exemption removal). T 17, CCR, 93115.1-93115.15.t.	11/16/06	Other
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, & 60210	11/16/06	Not applicable
Consumer Products. T 17, CCR, 94508, 94509, 94510, 94513 & 94523	11/17/06	Consumer products

Appendix Table A-1 Measures Adopted by the California Air Resource Board 1990 to 2006		
Measure	Hearing Date	Category
Emergency Regulation for Portable Equipment Registration Program, Airborne Toxic Control Measures and Portable and Stationary diesel-Fueled Engines. T 13, CCR, 2452, 2455, 2456, 2461; T17 CCR 93115, 93116.2, 93116.3	12/06/06	Off-road
Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations. T 17, CCR, 93102.1-93102.16	12/07/06	Not applicable
Voluntary Accelerated Retirement Regulation. T 13, CCR, 2601-2610 and appendices A-D	12/07/06	On-road

B. State Rules that Do Not Address Direct PM_{2.5} or PM_{2.5} Attainment Plan Precursors in the San Joaquin Valley

A substantial number of the measures adopted by CARB since 1990 do not affect direct PM_{2.5} or a PM_{2.5} attainment plan precursor emissions in the San Joaquin Valley. These types of measures include fee rules, identification of toxic air contaminants, area boundary designations, and controls for pollutants other than direct PM_{2.5} (or PM), NO_x, VOC, or SO₂. Appendix Table A-2 provides a list of these measures.

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Transported Pollutants (Ozone). T 17, CCR, 70500	12/04/89	Not an emissions reduction measure
Non-vehicular Test Methods. T 17, CCR, 94002, 94003 17, &26, 94146-94149, 94132, 94135, 94139, 94140	01/11/90	Not an emissions reduction measure
Test Method for Asbestos in Serpentine Aggregate. T 17, & 26, CCR, 94147, Method 435	04/12/90	Not an emissions reduction measure
Airborne Toxic Control Measure for Asbestos in Surfacing Applications. T 17, & 26, CCR, 93106	04/12/90	Not a PM emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.1, 90800, 90802-90803	05/10/90	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90704, 93300-93347	05/10/90	Not an emissions reduction measure
Dioxins Airborne Toxic Control Measure for Medical Waste Incinerators. T 17, CCR, 93104	07/12/90	Not a PM emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/14/90	Not an emissions reduction measure
Criteria for Area Designations for the State Ambient Air Quality Standard. T 17, CCR, 70303 & 70304	06/14/90	Not an emissions reduction measure
Emissions Reduction Accounting Procedures for California Clean Air Act. T 17, CCR, 70700-70704	07/12/90	Not an emissions reduction measure
Identification of Inorganic Arsenic as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/12/90	Not an emissions reduction measure
Transport Mitigation Regulations. T 17, CCR, 70600-70601	08/09/90	Not an emissions reduction measure
Air Toxic Fee Schedule & Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 90700-90704, 93300-93347	09/13/90	Not an emissions reduction measure
Identification of Trichloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/11/90	Not an emissions reduction measure
Revision to Designation Criteria. T 17, CCR, 60200-60204, 60208	11/08/90	Not an emissions reduction measure
Identification of Vinyl Chloride as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	11/13/90	Not an emissions reduction measure
Identification of Chloroform as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	12/13/90	Not an emissions reduction measure
Conflict of Interest Code. T 17, CCR, 95001, et. seq.	12/13/90	Not an emissions reduction measure
Permit Fee Regulations for Non -Vehicular Sources. T 17, CCR, 90800.2, 90801, 90803	02/24/91	Not an emissions reduction measure
Non - Vehicular Test Methods. T 17, CCR, 94131, 94132, 94142	04/11/91	Not an emissions reduction measure.
Acid Deposition Fee Regulations. T 17, CCR, 90621.2, 90620, 90622	04/11/91	Not an emissions reduction measure. Obsolete.

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Administrative Hearing Procedures. T 17, CCR, 60075.1, 60075.47	05/09/91	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700 - 90705	06/13/91	Not an emissions reduction measure
Agricultural Burning Guidelines. T 17, 80130, 80150, 80250, 80260, 80290	07/11/91	Not an emissions reduction measure
Identification of Metallic & Inorganic Nickel Compounds as a Toxic Air Contaminant. T 17, & 26, 93000	08/08/91	Not an emissions reduction measure
State Ambient Air Quality Standard for SO ₂ . T 17, CCR, 70100, 70200, 70201	10/10/91	Not an emissions reduction measure
Identification of Perchloroethylene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	10/10/91	Not an emissions reduction measure
Area Designations. T 17, CCR, 60200, 60209	11/14/91	Not an emissions reduction measure
Identification of Formaldehyde as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	03/12/92	Not an emissions reduction measure
Atmospheric Acidity Protection Fees. T 17, CCR, 90621.3	04/09/92	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.3, 90803	04/09/92	Not an emissions reduction measure
Criteria for Area Designations. T 17, CCR, 70303, 70304	05/14/92	Not an emissions reduction measure
Transported Air Pollutants. T 17, CCR, 70500	05/28/92	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90701, 90704, 90705	07/09/92	Not an emissions reduction measure
Identification of 1,3 Butadiene as a Toxic Air Contaminant. T 17, & 26, CCR, 93000	07/09/92	Not an emissions reduction measure
CFC Refrigerants in Air Conditioning Systems. T 13, CCR, 2500	09/10/92	Not a PM or PM _{2.5} attainment plan precursors emissions reduction measure
Criteria for Area Designations. T 17, CCR, 70303.5, 60200-60203, 60205, 70303	12/10/92	Not an emissions reduction measure
Transport Mitigation Regulations. T 17, CCR, 70600, 70601	03/11/93	Not an emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Identification of Federal Hazardous Air Pollutants as Toxic Air Contaminants. T 17, & 26, CCR, 93001, 39665, 39666	04/08/93	Not an emissions reduction measure
Acid Deposition Fee Regulations. T 17, CCR, 90622, 90621.4	04/08/93	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.4, 90803	04/08/93	Not an emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, & 26, CCR, 93300-93347	06/10/93	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/08/93	Not an emissions reduction measure
Mitigation Transport Pollutants. T 17, CCR, 70500, 70600	08/12/93	Not an emissions reduction measure
Airborne Toxic Control Measure for Perchloroethylene Dry Cleaning. T 17, & 26, CCR, 93109, 93110	10/14/93	Not a PM or PM _{2.5} attainment plan precursors emissions reduction measure
Conflict of Interest. T 17, CCR, 90500	11/18/93	Not an emissions reduction measure
Criteria for Area Designations. T 17, CCR, 60200-60202, 60204, 60206, 60208, 70300-70306	11/18/93	Not an emissions reduction measure
SCAQMD's Reclaim Consideration	03/10/94	Not a SJV control measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.5, 90803	04/14/94	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, & 26, CCR, 90700-90705	07/28/94	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201, 60204	11/09/94	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.6, 90803	04/27/95	Not an emissions reduction measure
Employee-Based Trip Reductions Emission Formula. T 13, CCR, 2330, 2331, 2332	06/29/95	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705 and Appendix A	01/25/96	Not an emissions reduction measure
Relaxation of Carbon Monoxide Emission Standards for Utility Engines. T 13, CCR, 2403 and incorporating test procedures	01/25/96	Carbon monoxide requirement

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90803, 90800.7	04/25/96	Not an emissions reduction measure
Basin Boundaries for Agricultural Burning (Mojave Desert, South Coast & Salton Sea). T 17, CCR, 60104, 60109, 60114, 80280, 80311	05/30/96	Not applicable to SJV
Regulation Improvement and Repeal. T 17, CCR, 93301-93355, Appendix A-E (emissions inventory)	05/30/96	Not an emissions reduction measure
Emissions Inventory Criteria & Guideline Report. T 17, CCR, 93300.5	07/25/96	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90701-90705 Appendix A to §§ 90700-90705	09/26/96	Not an emissions reduction measure
Stationary Source Test Methods. T 17, CCR, 94105, 94107, 94114, 94135, 94141, 94143, 94161	09/26/96	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201-60209	11/21/96	Not an emissions reduction measure
Transport Pollutants. T 17, CCR, 70500, 70600	11/21/96	Not an emissions reduction measure
Identification of Inorganic Lead as Toxic Air Contaminant (TAC). T 17, CCR, 93000	04/24/97	Not an emissions reduction measure
Interchangeable Emissions Reduction Credits. T 17, CCR, 91500	05/22/97	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR 90701-90705 and Appendix A §§ 90700-90705	11/13/97	Not an emissions reduction measure
Area Designations '97 . T 17, CCR, §§ 60201 & 60205	11/13/97	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR 90800	01/29/98	Not an emissions reduction measure
Classifying Minor Violations. T 17, CCR, 60090-60095	04/23/98	Not an emissions reduction measure
Airborne Toxic Control Measure for Chrome Plating. T 17, CCR, 93102	05/21/98	Not an emissions reduction measure
Identification of Diesel Exhaust as a Toxic Air Contaminant. T 17, CCR, 93000	08/27/98	Not an emissions reduction measure
Stationary Source Test Methods. T 17, CCR, 94101 - 94104, 94106, 94108 - 94113, 941T 17 - 94124, 94137 and revision of Method 12.	10/22/98	Not an emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Administrative Hearing Procedures. T 17, CCR, 60040 and 60075.1-60075.45	10/22/99	Not an emissions reduction measure
Area Designations and Criteria for the National and State Ambient Air Quality Standards for Ozone. T 17, CCR, 60301, 60202, 60205, 60206, 70300-70306, 70303.1	10/22/98	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90701-90705 and Appendix A	10/22/98	Not an emissions reduction measure
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201	11/18/99	Not an emissions reduction measure
Agricultural Burning Guidelines. T 17 Amendments 80145, 80T 179, 80100-80102, 80110, 80120, 80130, 80140, 80150, 80155, 80160, 80T 170, 80180, 80200, 80210, 80230, 80240, 80250, 80260, 80270, 80280, 80290, 80300, 80310, 80311, 80320, 80330	03/23/00	Not an emissions reduction measure
Air Toxic Control Measure for Asbestos Containing Serpentine. T 17, CCR, 93106	07/20/00	Not a PM or PM _{2.5} attainment plan precursors emissions reduction measure
Conflict of Interest Code. T 17, CCR, 95001, 95002, 95005, and subchapter 9	09/28/00	Not an emissions reduction measure
Rice Straw Conditional Burn Permit Program. T 17, CCR, 80101, 80156-80158	09/28/00	Not a SJV control measure (Sacramento Valley air basin only)
Air Toxics "Hot Spots" Fee Regulations. T 17, CCR, 90705 tables 1, 2, 3a, 3b, 3c, and 4	10/26/00	Not an emissions reduction measure
Area Designations for the State Ambient Air Quality Standard for Ozone. T 17, CCR, 60201	11/16/00	Not an emissions reduction measure
Ozone Transport Assessment. T 17, CCR, 70500 & 70600	04/26/01	Not an emissions reduction measure
Air Toxics "Hot Spots" Fee Regulation. T 17, CCR, 90700-90705	10/25/01	Not an emissions reduction measure
Review of California Ambient Air Quality Standards for Particulate Matter and Sulfates. T 17, CCR, 70100, 70200, and 70100.1	06/20/02	Not an emissions reduction measure
Administrative Civil Penalties Program. T 17, CCR, 60065.1 - 60065.45 and 60075.1 - 60075.45	12/12/02	Not an emissions reduction measure
Ozone Transport Mitigation Regulations. T 17, CCR, 70600 and 70601	05/22/03	Not an emissions reduction measure

Appendix Table A-2 Measures Adopted by the California Air Resources Board That Do Not Address PM_{2.5} in the San Joaquin Valley 1990 to 2006		
Measure	Hearing Date	Comments
Permit Fee Regulations for Non-vehicular Sources. T 17, CCR, 90800.75, 90800.9, 90804, 90800.8, 90801, 90802, and 90803	07/24/03	Not an emissions reduction measure
Area Designation Criteria and Area Designations for State PM _{2.5} and Ozone Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, 60210	01/22/04	Not an emissions reduction measure
Permit Fee Regulations for Non-vehicular Sources. T17, CCR 90805 and 90806; and 90800.8 and 90803	11/18/04	Not an emissions reduction measure
Area Designations. T 17, CCR, 60201, 60202, 60205, 60210	01/20/05	Not an emissions reduction measure
State Ambient Air Quality Standard for Ozone. T 17, CCR, 70100, 70100.1, and 70200	04/28/05	Not an emissions reduction measure
Definition of Large Confined Animal Facility. T 17, CCR 86500 and 86501	06/23/05	Not an emissions reduction measure
Identification of Tobacco Smoke as a Toxic Air Contaminant. T 17, CCR, 93000	01/26/06	Not an emissions reduction measure
Air Toxics "Hot Spots" Emissions Inventory Criteria and Guidelines. T 17, CCR, 93300.5 and document incorporated by reference	11/16/06	Not an emissions reduction measure
Area Designations for State Ambient Air Quality Standards. T 17, CCR, 60201, 60202, 60205, & 60210	11/16/06	Not an emissions reduction measure

C. State Fuel Measures

CARB has adopted a number of revisions to its reformulated gasoline program and clean diesel program since 1990, as well as measures addressing other motor vehicle fuels and fuel standards for off-road sources. Appendix Table A-3 is a list of these revisions.

Appendix Table A-3 Fuel Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Wintertime Limits for Sulfur in Diesel Fuel. T 13, CCR, 2255	06/21/90	Renumbered to section 2281. Approved 60 FR 43379 (8/21/95)
Limit on Aromatic Content of Diesel Fuel. T 13, CCR, 2256	12/13/90	Renumbered to section 2282. Approved 60 FR 43379 (8/21/95) (listed as 4/15/01 adoption in FR)
Diesel Fuel Regulations - Emergency. T 13, CCR, 2281(h), 2282(1)	10/15/93	Approved 60 FR 43379 (8/21/95)
Small Refiner Diesel. T 13, CCR, 2282(e)(1)	07/24/94	Approved 60 FR 43379 (8/21/95)
Diesel Fuel Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Approved 75 FR 26653 (5/12/10)
Specifications for Motor Vehicle Diesel Fuel. T 13 & T 17, CCR, 1961, 2281, 2282, 2701, 2284, 2285, 93114, and incorporated test procedure	07/24/03	Approved 75 FR 26653 (5/12/10)
Emergency Regulation for Temporary Delay of Diesel Fuel Lubricity Standard. T 13, CCR, 2284	11/24/04	Temporary delay of standard. Expired
Diesel Fuel Standards for Harbor Craft & Locomotives. T 13, CCR, 2299, 2281, 2282, and 2284, and T 17, CCR, 93117	11/18/04	NO _x reductions estimated at 0.1 tpd for SJV. <i>See</i> CARB 6/29/09 Letter
California Reformulated Gasoline (CaRFG), Phase I. T 13, CCR, 2251.5	09/27/90	RVP standard for period between 1992 and 1996. Obsolete.
California Reformulated Gasoline, Phase II. T 13, CCR, 2250, 2255.1, 2252, 2260 - 2272, 2295	11/21/91	Approved 60 FR 43379 (8/21/95)
Wintertime Gasoline Program. T 13, CCR, 2258, 2298, 2251.5, 2296	11/21/91	Approved 60 FR 43379 (8/21/95)
Predictive Model for Phase II CaRFG. T 13, CCR, 2261, 2262-2270	06/09/94	Superseded by 11/18/04 & 6/14/07 rules
Test Method for Oxygen in Gasoline. T 13, CCR, 2251.5(c), 2258(c), 2263(b)	06/29/95	Section 2251.5 - obsolete; section 2258 wintertime; section 2263, superseded
Wintertime Oxygenate Program. T 13, CCR, 2258, 2251.5, 2263(b), 2267, 2298, 2259, 2283, 2293.5	09/09/93	Carbon monoxide control measure
Test Methods for CaRFG 13, CCR, 2263(b)	10/26/95	Superseded by 11/18/04 & 6/14/07 rules
Required Additives in Gasoline (Deposit Control Additives). T 13, CCR, 2257 and incorporates testing procedures.	11/16/95	Superseded by 11/18/04 & 6/14/07 rules

Appendix Table A-3 Fuel Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
CaRFG Housekeeping & CARBOB. T 13, CCR, 2263.7, 2266.5, 2260, 226 _{2.5} , 2264, 2265, 2272	12/14/95	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Variance Requirements. T 13, CCR, 2271 (Emergency)	01/25/96	Superseded by 11/18/04 & 6/14/07 rules
Regulation Improvements and Repeals (fuel additives). T 13, CCR, 2201, 2202	05/30/96	Repealed sections
Cleaner Burning Gasoline Model Flexibility. T 13, CCR, Sections 2260, 2262.1, 2262.3, 2262.4, 226 _{2.5} , 2262.6, 2262.7 and 2265	08/27/98	Superseded by 11/18/04 & 6/14/07 rules
Gasoline Deposit Control Additive Regulation. T 13, CCR, 2257, and incorporating test procedures	09/24/98	Superseded by 11/18/04 & 6/14/07 rules
Cleaner Burning Gasoline (Increasing the Oxygen Content). T 13, CCR, sections 226 _{2.5} (b) and 2265(a)(2)	12/11/98	Wintertime gasoline for South Coast and Imperial County. Not applicable to the SJV area.
Cleaner Burning Gasoline, Oxygen Requirement for Wintertime In Lake Tahoe Area/Gas Pump Labeling for MTBE. T 13, CCR, 226 _{2.5} , and 2273	06/24/99	Not applicable to the SJV/SC area/Obsolete
CaRFG Phase 3 Amendments (Phase out of MTBE, standards, predictive model). T 13, CCR, 2260, 2261, 2262.1, 226 _{2.5} , 2263, 2264, 2264.2, 2265, 2266 etc...	12/09/99	2262.1 renumber to 2262.4; 2264 (designation of alternative limits) not approved; otherwise superseded by 11/18/04 and 6/14/07 rules
CaRFG Phase 3 Test Methods. T 13, CCR, sections 2263(b)	11/16/00	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Follow-up Amendments. T 13, CCR, sections 2260, 2261, 2262.3, 226 _{2.5} , 2263, 2264, 2265, 2266, 2266.5, 2270, 2272, 2273, 2282, 2296, 2297, 2262.9 and incorporated test procedures	11/16/00	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Amendments. T 13, CCR, 2261, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2266.5, 2269, 2271, 2272, 2265, and 2296	07/25/02	Superseded by 11/18/04 & 6/14/07 rules
CaRFG Phase 3 Amendments (specifications for De Minimus Levels of Oxygenates and MTBE Phase Out Issues). T 13, CCR, 2261, 2262.6, 2263, 2266.5, 2272, 2273, 2260, 2273.5	12/12/02	Superseded by 11/18/04 & 6/14/07 rule. Approved 75 FR 26653 (5/12/10) (except for section 2272 (CARFG3 standards for small refineries) and 2273.5 (requirement to identify gasoline containing ethanol when delivered to retail station))

Appendix Table A-3 Fuel Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
California Reformulated Gasoline, Phase 3. T 13, CCR, 2260, 2262, 2262.4, 226 _{2.5} , 2262.6, 2262.9, 2263, 2265 (and the incorporated "California Procedures"), and 2266.5	11/18/04	Approved 75 FR 26653 (5/12/10)
Reid Vapor Pressure Limit. Emergency Rule. T 13, CCR, 2262 and 2262.4	08/08/05	Operative for September and October 2005 only. Obsolete.
Specifications for Liquid Petroleum Gas Used as a Motor Vehicle Fuel. T 13, CCR, 2292.6	12/11/98	No identifiable emissions reductions
Liquefied Petroleum Gas Propane Limit Specification Delay. T 13, CCR, 2292.6	03/27/97	Expired

D. State On-Road Mobile Sources Measures

Appendix Tables A-4 and A-5 list measures adopted by CARB since 1990 for on-road and off-road sources.

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Certification Procedure for Aftermarket Parts. VC 27156 & 38391	02/08/90	Compliance provisions
Emission Standards for Medium Duty Vehicles. T 13, CCR, 1900, 1956.8, 1960.1, 1968.1, 2061, 2112, 2139	06/14/90	Waiver granted September 16, 1994 (59 FR 48625 (9/22/94))
Evaporative Emission Standards. T 13, CCR, 1976	08/09/90	Waiver granted August 25, 1994 (59 FR 46979 (9/13/94))
Low Emission Vehicles and Clean Fuels. T 13, CCR, 1900, 1904, 1956.8, 1960.1, 1960.1.5, 1960.5 and 2111, 2112, 2125, and 2139, 2061.	09/28/90	Waivers granted January 7, 1993 & April 6, 1998 (58 FR 4166 (1/13/93) & 63 FR 18403 (4/15/98))
Heavy Duty Diesel Smoke Emission Testing. T 13, CCR, 2180-2187	11/08/90	Inspection program

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Onboard Diagnostics for Light-Duty Trucks and Light & Medium-Duty Motor Vehicles. T 13, CCR, 1977, 1968.1	09/12/91	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1, 1977	11/12/91	
Low Emission Vehicles amendments revising reactivity adjustment factor (RAF) provisions and adopting a RAF for M85 transitional low emission vehicles. T 13, CCR, 1960.1	11/14/91	Confirm within the scope finding requested February 18, 1993
Alternative Motor Vehicle Fuel Certification Fuel Specification. T 13 & 26, CCR, 2290-2292.7, 1960.1(k), 1956.8(b), 1956.8(d)	3/12/92	Confirm within the scope finding requested February 17, 1994
Standards and Test Procedures for Alternative Fuel Retrofit Systems. T 13, CCR, 2030, 2031	05/14/92	Compliance provisions
Phase 2 RFG certification fuel specifications. T 13, CCR, 1960.1, 1956.8(d)	08/13/92	Confirm within the scope finding requested February 17, 1994
Substitute Fuel or Clean Fuel Incorporated Test Procedures. T 13, CCR, 1960.1(k), 2317	11/12/92	Confirm within the scope finding requested February 17, 1994
Smoke Self Inspection Program for Heavy Duty Diesel & Gasoline Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	12/10/92	Inspection program
Certification Requirements for Low Emission Passenger Cars, Light-Duty Trucks & Medium Duty Vehicles. T 13, CCR, 1960.1, 1976, 2061, 1900	01/14/93	Confirm within the scope finding requested February 21, 1994
Onboard Diagnostic, Phase II. T 13, CCR, 1968.1	07/09/93	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Urban Transit Buses. T 13, CCR, 1956.8, 1965, 2112	06/10/93	Found within the scope September 28, 2004 (69 FR 59920 (October 6, 2004))
Evaporative Emission Standards and Test Procedures. T 13, CCR, 1976	02/10/94	Waiver granted July 28, 1999 (64 FR 42689 (8/5/99))
Diesel Fuel Certification. T 13, CCR, 1956.8(b)&(d), 1960.1(k), 2292.6	09/22/94	Confirm within the scope finding requested September 14, 1995
Self Inspection Program for Heavy Duty Diesel Engines. T 13, CCR, 2190-2194, 2180-2187, 1956.8(b)	11/09/94	Inspection program
Onboard Diagnostics, Phase II. T 13, CCR, 1963.1, & Certification Procedures	12/08/94	Waiver granted October 2, 1996 (61 FR 53371 (10/11/96))
Periodic Smoke Inspection Program. T 13, CCR, 2190	12/08/94	Inspection program

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Heavy Duty Vehicle Exhaust Emission Standards. T 13, CCR, 1956.8 and incorporate test procedures.	06/29/95	Found within the scope September 28, 2004 (69 FR 59920 (10/6/04))
Onboard Refueling Vapor Recovery Standards. T 13, CCR, 1976, 1978 and incorporate test procedures	06/29/95	Waiver granted August 13, 2002 (67 FR 54180 (8/21/02))
Retrofit Emission Standards. T 13, CCR, 1956.9, 2030, 2031, and incorporate test procedures	07/27/95	Compliance provision
Low Emission Vehicle Standards 3 (LEV 3). T 13, CCR, 1956.8, 1960.1, 1965, 2101, 2061, 2062, and incorporate test procedures	09/28/95	Confirm within the scope finding requested October 8, 1996.
Postpone Zero Emission Vehicle Requirements. T 13, CCR, 1900, 1960.1, 1976	03/28/96	Found within the scope January 18, 2001 (66 FR 7751 (1/25/01))
Diesel Fuel Certification Test Methods. T 13, CCR, 1956.8(b), 1960.1(k), 2281(c), 2282(b), (c) and (g)	10/24/96	Confirm within the scope finding requested November 24, 1997
Onboard Diagnostics, Phase II, Technical Status. T 13, CCR, 1968.1, 2030, 2031	12/12/96	Initial notice 69 FR 5542 (February 5, 2004)
Postpone Enhanced Evaporative Emission Requirements for Ultra-Small Volume Vehicle Manufacturers. T 13, CCR, 1976 and incorporate test procedures	05/22/97	Found within the scope July 28, 1999 (64 FR 42689 (8/5/99))
Off-Cycle Emissions Supplemental Federal Test Procedures (SFTPs). T 13, CCR, 1960.1, 2101 and incorporate test procedures	07/24/97	Waiver granted September 30, 2004 (69 FR 60996 (10/14/04))
Heavy Duty Vehicle Smoke Inspection Program/Periodic Smoke Inspection Program. T 13, CCR, 2180-2188 and 2190-2194	12/11/97	Inspection program
Heavy Duty Vehicle Regulations: 2004 Standards. T 13, CCR, 1956.8, 1965, 2036, 2112 and test procedures	04/23/98	Confirm within the scope finding requested December 26, 2001
Low Emission Vehicles Standards (LEV 2) and Compliance Assurance Program (CAP 2000). T 13, CCR, 1961 & 1962 (both new); 1900, 1960.1, 1965, 1968.1, 1976, 1978, 2037, 2038, 2062, 2101, 2106, 2107, 2110, 2112, 2114, 2119, 2130, 2137-2140, 2143-2148	11/05/98	Waiver granted April 11, 2003 (68 FR 19811 (4/22/03))/found within the scope (1999 ZEV amendments) December 21, 2006 (71 FR 78190 (12/28/06))
Exhaust Standards for (On-Road) Motorcycles. T 13, CCR, 1958	12/10/98	Waiver granted July 27, 2006 (71 FR 44027 (8/3/06))
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2600-2610	12/10/98	Establishes standards for a voluntary accelerated retirement program. Revised 2/21/06 and 12/7/06

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Clean Fuels Regulation Requirements. T 13, CCR, sections 2300-2317, and 2303.5, 2311.5	07/22/99	Removal of obsolete provisions, streamlining and other minor changes to 9/1990 rule.
Transit Bus Standards. T 13, CCR, 1956.1, 1956.2, 1956.3, 1956.4, 1956.8, 1965	02/24/00	Combination of fleet requirements, emission standards, and zero-emission bus standards. Fleet requirements achieve approximately 2 tpd NO _x reductions statewide, so minimal effect in SJV. Federal & state emission standards are the same for 2010 MY buses.
Light-and Medium Duty Low Emission Vehicle Alignment with Federal Standards. Exhaust Emission Standards for Heavy Duty Gas Engines. T 13, CCR, 1956.8 & 1961	12/07/00	Waiver granted for LDV & HDV April 11, 2003 (68 FR 19811 (4/22/03)) Initial notice on within-the-scope finding request for HDGE: 72 FR 27114 (May 14, 2007).
Heavy Duty Diesel Engines "Not-to-Exceed (NTE)" Test Procedures. T 13 CCR, 1956.8, 2065	12/07/00	Confirm within the scope finding requested December 26, 2001.
Zero Emission Vehicle Regulation Update. T 13, CCR, 1900, 1960.1(k), 1961, 1962 & incorporated Test Procedure	01/25/01	Found within the scope December 21, 2006 (71 FR 78190 (12/28/06))
Zero Emission Vehicle Infrastructure and Standardization of Electric Vehicle Charging Equipment. T 13, CCR, 1900(b), 1962(b) 1962.1	06/28/01	Found within the scope December 21, 2006 (71 FR 78190 (12/28/06))
Heavy Duty Diesel Engine Standards for 2007 and Later. T 13, CCR, 1956.8 and incorporate test procedures	10/25/01	Waiver granted August 19, 2005 (70 FR 50322 (8/26/05))
Low Emission Vehicle Regulations. T 13, CCR, 1960.1, 1960.5, 1961, 1962 and incorporate test procedures and guidelines	11/15/01	Found within the scope April 21, 2005 (70 FR 22034 (4/28/05))
California Motor Vehicle Service Information Rule. T 13&17, CCR, 1969 & 60060.1 - 60060.7	12/13/01	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
Voluntary Accelerated Light Duty Vehicle Retirement Regulations. T 13, CCR, 2601-2605, 2606 & appendices C & D, and 2607-2610	02/21/02	Establishes standards for a voluntary accelerated retirement program. Revised 12/7/06.
On-Board Diagnostic II Review Amendments. T 13, CCR, 1968.1, 1968.2, 1968.5	04/25/02	Initial notice 69 FR 5542 (2/5/04)

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements. T 13, CCR, 2700-2710	05/16/02	Procedures to verify diesel retrofit technology.
Revision to Transit Bus Regulations Amendments. T 13, CCR, 1956.1, 1956.2, 1956.4, 1956.8, and 2112, & documents incorporated by reference	10/24/02	Slight relaxation in requirements over 2000 rule.
Low Emission Vehicles II. Align Heavy Duty Gas Engine Standards with Federal Standards; minor administrative changes. T 13, CCR, 1961, 1965, 1956.8, 1956.1, 1978, 2065 and documents incorporated by reference	12/12/02	Waiver granted August 19, 2005 (70 FR 50322 (8/26/05)) for all but HDGE. HDGE standards adopted to harmonize with EPA's. Initial notice on within-the-scope finding request for HDGE: 72 FR 27114 (5/14/07).
Airborne Toxic Control Measure for Diesel Particulate from School Bus Idling. T13, CCR, 2480	12/12/02	No emissions reductions claimed.
Zero Emission Vehicle Amendments for 2003. T 13, CCR, 1960.1(k), 1961(a) and (d), 1900, 1962, and documents incorporated by reference	03/25/03	Found within the scope December 21, 2005 (71 FR 78190 (12/28/06))
Solid Waste Collection Vehicles. T 13, CCR, 2020, 2021, 2021.1, 2021.2	09/24/03	Diesel reduction program. Minimal reductions. <i>See</i> CARB, "Staff Report: Initial Statement Of Reasons, Proposed Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles," June 6, 2003, p. 53.
Airborne Toxic Control Measure for Diesel Particulate from Transport Refrigeration Units. T 13, CCR, 2022 and 2477	12/11/03	Waiver granted (non-road) January 9, 2009 (74 FR 3030 (1/16/2009))
Diesel Retrofit Verification Procedure, Warranty and In-Use Compliance Requirements (Amendments). T 13, CCR, 2701-2707 & 2709	12/11/03	Procedures to verify diesel retrofit technology.
CA Motor Vehicle Service Information Rule. T 13, CCR, 1969	01/22/04	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
Heavy Duty Diesel Engine-Chip Reflash. T 13, CCR, 2011, 2180.1, 2181, 2184, 2185, 2186, 2192, and 2194	03/27/04	Compliance provision.

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Engine Manufacturer Diagnostic System Requirements for 2007 and Subsequent Model Heavy Duty Engines. T 13, CCR, 1971	05/20/04	Waiver granted December 22, 2005 (71 FR 335 (1/4/06))
Urban Bus Engines/Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, 1956.3, and 1956.4	06/24/04	Various modifications to urban/transit bus standards.
Airborne Toxic Control Measure for Diesel Particulate from Diesel Fueled Commercial Vehicle Idling. T 13, CCR, 2485	07/22/04	Diesel reduction program
Greenhouse Gas Standards. T 13, CCR, 1961.1, 1900, 1961 and Incorporated Test Procedures	09/23/04	Waiver granted June 30, 2009 (74 FR 32744 (July 8, 2009))
Transit Fleet Rule. T 13, CCR, 2023, 2023.1, 2023.2, 2023.3, 2023.4, 1956.1, 2020, 2021, repeal 1956.2, 1956.3, 1956.4	02/24/05	Diesel reduction program
On-Board Diagnostic System Requirements for 2010 and Subsequent Model-Year Heavy-Duty Engines (HD OBD). T 13, CCR, 1971.1	07/21/05	Waiver granted August 13, 2008 (73 FR 52042 (9/8/08))
2007-2009 Model-Year Heavy Duty Urban Bus Engines and the Fleet Rule for Transit Agencies. T 13, CCR, 1956.1, 1956.2, and 1956.8	09/15/05 & 10/20/05	Aligns State emission standards with federal emission standards.
Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008. T 13, CCR section 1956.8 and the incorporated document	10/20/05	Confirm not pre-empted or within the scope finding requested. Initial notice 75 FR 43975 (7/27/2010)
Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies and Utilities. T 13, CCR, 2022 and 2022.1	12/08/05	Diesel reduction program. Minimal reductions. <i>See</i> CARB, "Staff Report: Initial Statement Of Reasons, Proposed Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated By Public Agencies And Utilities," October 21, 2005, p. 55.
AB1009 Heavy-Duty Vehicle Smoke Inspection Program. T 13, CCR, 2180, 2180.1, 2181, 2182, 2183, 2184, 2185, 2186, 2187, and 2188, 2189	01/26/06	Requires trucks have emission control labels.
Diesel Verification Procedure, Warranty & In-Use. T 13, CCR, 2702, 2703, 2704, 2706, 2707, and 2709.	03/23/06	Procedures to verify diesel retrofit technology, supporting rule for in-use control measures.

Appendix Table A-4 On-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Technical Amendments to Evaporative Exhaust and Evaporative Emissions Test Procedures. T 13, CCR, 1961,1976 and 1978.	05/25/06	Within the scope finding July 22, 2010 (75 FR 44948 (July 27, 2010)).
California Motor Vehicle Service Information Rule. T 13, CCR, 1969 and incorporated documents	06/22/06	Compliance provision. Very similar to EPA regulations at 40 CFR 86.1808.01
On-Board Diagnostic II. T 13, CCR, 1968.2, 1968.5, 2035, 2037 and 2038	09/28/06	Confirm within the scope finding requested.
Heavy-Duty In-Use Compliance Regulation. T 13, CCR, 1956.1, 1956.8, and documents incorporated by reference	09/28/06	Compliance provision. Compliance program "essentially identical to EPA's." <i>See Updated Information Digest for the Rule.</i>
Zero Emission Bus Regulation. T13, CCR, 2023.1, 2023.3, & 2023.4	10/19/06	Delays ZEB requirements due to high bus costs and unproven durability, reliability and ability to produce the number of buses required by the regulation. <i>See Updated Information Digest.</i>
Voluntary Accelerated Retirement Regulation. T 13, CCR, 2601-2610 and appendices A-D	12/07/06	Establishes standards for a voluntary accelerated retirement program.

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Emission Standards for Utility and Lawn and Garden Engines. T 17, CCR, 2400 et. seq.	12/13/90	Waiver granted July 5, 1995 (60 FR 37440 (7/20/95))
1-year Implementation Delay in Emission Standards for Utility Engines. T 13, CCR, 2400, 2403-2407	04/08/93	

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Utility and Lawn and Garden Equipment Engines. T 13, CCR, 2403(c), 11(a)(1)(I)(ii), 4(a)(1)(I)(ii)	07/28/94	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
Utility and Lawn and Garden Equipment Engines. CO Standards	1/25/96	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
Small Off-Road Engines (SORE). T 13, CCR, 2400, 2410-2414	03/26/98	Within the scope finding November 9, 2000 (65 FR 69767 (11/20/00)), waiver granted (durability requirements), November 10, 2003 (65 FR 65702 (11/21/03)).
Small Off-Road Engines (SORE). T 13, CCR, 2400-2409, 2405.1, 2405.2, 2405.3, 2750-2754, 2754.1, 2754.2, 2755-2767, 2767.1, 2768-2773 and the documents incorporated by reference	09/25/03	Waiver granted, December 11, 2006 (71 FR 75536 (12/15/2006))
Off-Highway Recreational Vehicles. T 13, CCR, 2410-2414, 2111-2140	01/03/94	Waiver granted December 23, 1996 (61 FR 69093 (12/31/1996))
Wintertime Requirements for Utility Engines & Off-Highway Vehicles. T 13, CCR, 2403	09/26/96	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))
1997 & Later Model Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2410-2414, 2415	12/10/98	Within the scope finding request March 4, 2000
Off-Highway Recreation Vehicles. T13, CCR, 2415	07/24/03	Addition to March 4, 2000 request November 19, 2004. Made changes to riding season restrictions.
Off-Highway Recreational Vehicles and Engines. T 13, CCR, 2411-2413, 2415 & documents incorporated by reference	07/20/06	Adopted evaporative emission standards identical to EPA's.
Heavy Duty Diesel Cycle Engines. T 13, CCR, 2420-2427	01/09/92	Waiver granted May 15, 1995 (60 FR 48981 (9/21/1995))
Exemption of Military Tactical Vehicles. T 13, CCR, 1905, 2400, 2420	12/14/95	Within the scope finding November 9, 2000 (65 FR 69763 (11/20/00))

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Off-Road Compression Ignition Engines. T 13, CCR, 2111, 2112, 2137, 2139, 2140, 2141, 2144, 2400, 2401, 2403, 2420, 2421, 2423-2427, & appendix A to article 2.1.	01/27/00	Waiver granted, February 5, 2010 (75 FR 8056 (2/23/2010))
Off-Road Compression Ignition Engines. T 13, CCR, 2420, 2421, 2423, 2424, 2425, 2427	12/09/04	Waiver granted February 5, 2010 (75 FR 8056 (2/23/2010))
In-Use Off-Road Diesel Vehicles. T 13, CCR, 2449	07/26/07	Notice of opportunity for public hearing and comment (on waiver), 75 FR 11880 (3/12/2010).
Large Off-Road Spark-Ignition Engine Regulations. T 13, CCR, 2430 et seq., and 2411-2414	10/22/98	Waiver granted May 15, 2006 (71 FR 29623 (5/23/2006))
Fork Lifts and Other Industrial Equipment. (Large Off-Road Spark Ignition Engines > 1 liter) T 13, CCR 2430, 2433, 2434. Adopt 2775, 2775.1, 2775.2, 2780, 2781, 2783, 2784, 2785, 2786, 2787, 2788, and 2789.	05/26/06	Adopts EPA's Standards for 2007; adopts more stringent standards for 2010.
Emission Standards and Test Procedures for 2001 Marine Engines. T 13, CCR, 2440 <i>et seq</i>	12/10/98	Waiver granted March 22, 2007 (59 FR 14546 (March 28, 2007))
Marine Inboard Engines. T 13, CCR, 2111, 2112, 2139, 2140, 2147, 2440-2442, 2443.1-2443.3, 2444, 2445.1, 2445.2, 2446, 2444.2 and incorporation of documents by reference	07/26/01	Waiver granted in part March 22, 2007 (59 FR 14546 (March 28, 2007)) 2007 standards waiver granted April 26, 2011 (76 FR 24872 (5/3/11))
Marine Inboard Sterndrive Engines. T 13 CCR 2111, 2112, 2441, 2442, 2444.2, 2445.1, 2446, 2447, and incorporated document	11/17/05	Revision to year 2007 standards in 7/26/2001 marine inboard engine standards. Waiver requested February 7, 2008.
Portable Equipment Registration Program. T 13, CCR, 2450-2465	03/27/97	Revised by June 22, 2006 rule Waiver request withdrawn/replaced by favor of December 5, 2008 request
Revisions to Statewide Portable Equipment Registration Program. T 13, CCR, 2450-2463	12/10/98	Revised by June 22, 2006 rule
Modifications to the Statewide Portable Equipment Registration Program (PERP) Regulations . T 13, CCR Amendments to 2450-2465, and repeal of 2466	02/26/04	Revised by June 22, 2006 rule

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 17, CCR, 93116, 93116.1, 93116.2, 93116.3, 93116.4, and 93116.5	02/26/04	Notice of opportunity for public hearing and comment published February 9, 2011 (76 FR 7196) Within-the-scope finding/waiver requested March 28, 2005.
Portable Equipment Registration Program. T 13, CCR, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, and 2465	06/22/06	Notice of opportunity for public hearing and comment published February 9, 2011 (76 FR 7194) Within-the-scope finding/waiver requested December 5, 2008.
Emergency Regulation for Portable Equipment Registration Program Airborne Toxic Control Measures and Portable and Stationary diesel-Fueled Engines. T 13, CCR, 2452, 2455, 2456, 2461; T17 CCR 93115, 93116.2, 93116.3	12/06/06	Expired.
Portable Equipment Registration Program and Airborne Toxic Control Measure for Diesel-Fueled Portable Engines. T 13, CCR, 2451, 2452, 2456, 2458, 2459, 2460, 2461, and 2462, T 17, CCR, 93116.1, 93116.2, 93116.3, 93116.3.1	03/22/07	Notice of opportunity for public hearing and comment published February 9, 2011 (76 FR 7194) Within-the-scope finding/waiver requested December 5, 2008.
Aftermarket Parts for Off-Road Engines. T 13, CCR, 2470-2476	11/19/98	Compliance measure
Portable Container Spillage Control Measure. T 13, CCR, 2470-2478	09/23/99	Similar federal regulation. 40 CFR part 59, subpart F.
Portable Fuel Containers (PFC) [Part 1 of 2]. T 13, CCR, 2467 and 2467.1	09/15/05	Similar federal regulation. 40 CFR part 59, subpart F.
Portable Fuel Containers (PFC) [Part 2 of 2]. T 13, CCR 2467.2, 2467.3, 2467.4, 2467.5, 2467.6, 2467.7; repeal of 2467.8, and adoption of new 2467.8 and 2467.9.	09/15/05	Similar federal regulation. 40 CFR part 59, subpart F.
Airborne Toxic Control Measure for Diesel Particulate for Transport Refrigeration Units. T 13, CCR, 2022 & 2477	12/11/03	Waiver granted (non-road) January 9, 2009 (74 FR 3030 (1/16/2009))
Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. T 13, CCR, 2479	12/08/05	Notice of opportunity for public hearing and comment published February 1, 2011 (76 FR 5586) Within-the-scope finding and waiver request January 29, 2007

Appendix Table A-5 Off-Road Mobile Source Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Airborne Toxic Control Measure for Cruise Ships Onboard Incineration. T 17, CCR, 93119	11/17/05	No emissions reductions. No cruise ships subject to rule call at SJV ports. <i>See</i> Initial Statement of Reasons for Rule, p. II-1.
Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline. T 13, CCR, 2299.1 and T 17, CCR, 93118	12/08/05	No emissions reductions claimed for SJV.
Airborne Toxic Control Measure for Cruise Ships and Ocean-Going Ships Onboard Incineration (amendments). T 17, CCR, 93119	11/16/06	No emissions reductions claimed for SJV.
Ocean-Going Vessels At Berth (Shore Power). T 13, CCR, 2299.3 and T 17, CCR, 93118.3 and documents incorporated by reference	12/06/07	No emissions reductions claimed
Commercial Harbor Craft. T 13, CCR, 2222 and incorporated "California Evaluation Procedures for New Aftermarket Catalytic Converters"	11/15/07	No emissions reductions claimed
Cleaner Fuels in Ocean-Going Vessel Main Engines and Auxiliary Boiler. T 13, CCR, 2299.2 and T 17, CCR, section 93118.2	07/24/08	Proposed approval signed June 29, 2011

E. State Consumer Product Measures

California has been regulating the VOC content of consumer products for 20 years and continues to tighten standards and regulate more products. Appendix Table A-6 is a list of CARB's rulemaking actions on consumer products since 1990.

Appendix Table A-6 Consumer Products Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Antiperspirant/Deodorants. T 17, CCR, 94500-94506	11/09/89	Approved 8/21/95 (60 FR 43379)

Appendix Table A-6 Consumer Products Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Consumer Products BAAQMD. T 17, CCR, 94520-94526	06/14/90	Not applicable to the SJV area
Phase I - Consumer Products. T 17, CCR, 94507-94517	10/11/90	Approved 8/21/95 (60 FR 43379)
Phase II - Consumer Products. T 17, CCR, 94501, 94502, 94505, 94514, 94503.5, 94506, 94507 - 94513, 94515	01/09/92	Approved 8/21/95 (60 FR 43379)
Notice of General Public Interest for Consumer Products. T 17, CCR, 94507 - 94517	11/30/92	Not a control measure
Alternative Control Plan for Consumer Products. T 17, CCR, 94540-94555	09/22/94	Voluntary compliance option. No action.
Aerosol Coating Products and Alternative Control Plan. T 17, CCR, 94520-94528, 94540-94543, 94547.	03/23/95	Superseded by 6/22/00 rule.
Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products. T 17, CCR, 94500-94506, 94508, 94521	09/28/95	Superseded by 6/24/04 rule for antiperspirants and deodorants; superseded by 11/17/06 rule for consumer products; superseded by 11/17/06 rule for aerosol coating products.
Antiperspirants and Deodorants, Consumer Products, Aerosol Coating Products (ARB Test Method 310). T 17, CCR, 94506(a), 94515(a), 94526	11/21/96	Superseded by 6/24/04 rule for antiperspirants and deodorants; superseded by 11/17/16 rule for consumer products; superseded by 11/17/06 rule for aerosol coating products.
Consumer Products and Aerosol Coating Products Amendments. T 17, CCR, 94508-94515, 99517, 94321	11/21/96	Superseded by 11/17/06 rule
Consumer Products (Hair Spray) Amendments. T 17, CCR, 94509, 94513, 94514	03/27/97	Voluntary compliance option. No action.
Consumer Products (Mid-Term Measures) Amendments. T 17, CCR, 94508, 94509, 94513	07/24/97	Superseded by 11/17/06 rule
Consumer Products (Hairspray Credit Program). T 17, CCR, 94502, 94509, 94522, & 94548	11/13/97	Voluntary compliance option. No action.
Consumer Products, Aerosol Coatings & Antiperspirants and Deodorants. T 17, CCR, 94501, 94508, 94521, 94522, and 94524	11/19/98	Superseded by 11/17/06 rule
Consumer Products - LVP-VOC Definitions And Test Methods. T 17, CCR, 94506, 94506.5, 94508(a)(78), 94515 and 94526, and the amendment of CARB Method 310	11/19/98	Superseded by 6/24/04 rule for test method 310 and 11/17/06 rule for rest.

Appendix Table A-6 Consumer Products Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
California Consumer Products Regulation Mid-Term Measures II. T 17, CCR, 94508, 94509, and 94513	10/28/99	Superseded by 11/17/06 rule
Consumer Products Aerosol Adhesives Control Measure. T 17, CCR, 94508, 94509, 94512, 94513	05/25/00	Superseded by 11/17/06 rule
Aerosol (Paint) Coatings Products. T 17, CCR, 94700, 94701, 94521-94524, 94526	06/22/00	Approved 9/13/05 70 FR 53920; superseded by 11/17/06 rule
Antiperspirant and Deodorant Regulations. T 17, CCR, 94502, 94504	10/26/00	Superseded by 6/24/04 rule
Revised Tables of Maximum Incremental Reactivity Values. T 1, CCR, 94700.	12/03/03	Approved 9/13/05 70 FR 53920; superseded by 11/17/06 rule
Consumer Products & Methods 310/ATCM for Para-Dichlorobenzene. T 17, CCR, 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, and CARB Method 310, which is incorporated by reference	06/24/04	Approved November 4, 2009 (74 FR 57074) (EO order date of 5/6/05)
Consumer Products. T 17, CCR, 94508, 94509, 94510, 94513 & 94523	11/17/06	Approved November 4, 2009 (74 FR 57074) (EO order date 9/16/07)

F. State Vapor Recovery Measures

Under California State law (Health and Safety Code Sections 41954), CARB is required to adopt procedures and performance standards for controlling gasoline emissions from gasoline marketing operations, including transfer and storage operations. State law also authorizes CARB, in cooperation with the districts, to certify vapor recovery systems, identify defective equipment, and develop test methods. The installation and operation of CARB-certified vapor recovery equipment is required and enforced by SJVAPCD Rules 4621 and 4622. Appendix Table A-7 is a list of rulemaking actions taken by CARB since 1990 that address vapor recovery equipment certification, defects, and/or test methods.

Appendix Table A-7 Gasoline Vapor Recovery Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015, 94150-94160, 94000-94004, 94007.	06/29/95	CARB sets requirements for and certifies vapor recovery equipment. District rules establish requirements for the installation of CARB-certified equipment. <i>See</i> SJVAPCD Rules 4621 & 4622
Gasoline Vapor Recovery Systems. T 17, CCR, 94010-94015 and 94150, 94156, 94157, 94158, 94159, 94160, 94162	08/27/98	
Gasoline Vapor Recovery Systems. T 17, CCR, 94011, 94153, 94155, and incorporated test procedures, CP-201, TP- 201.4, and TP-201.6	06/24/99	
Enhanced Gasoline Vapor Recovery Systems (In Station Diagnostics and Onboard Refueling Vapor Recovery). T 17, CCR, 94011	03/23/00	
Enhanced Gasoline Vapor Recovery Systems (Emergency Filing CP-201, section 18). T 17, CCR, 94011	03/23/00	
Gasoline Vapor Recovery Systems Test Methods and Compliance Procedures. T 17, CCR, 94010, 94011, 94153, 94155, 94163, 94164, 94165 & incorporated procedures	10/25/01	
Gasoline Vapor Recovery Systems Defects. T 17, CCR, 94006 and incorporated document.	11/15/01	
Gasoline Vapor Recovery Systems Test Procedures. T 17, CCR, 94010, 94011, 94163, 94164, and 94165 and procedures incorporated by reference, and 94166, 94167, and incorporation by reference.	12/12/02	
Unihose Gasoline Vapor Recovery Systems. T17, CCR, 94011	07/22/04	
Gasoline Vapor Recovery Systems at Dispensing Facilities. Emergency Filing. T 17, CCR, 94011	07/22/04	
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006(b) & incorporated document	08/24/04	
Enhanced Gasoline Vapor Recovery Systems Extension. T 17, CCR, 94011 and certification procedure	11/18/04	
Gasoline Vapor Recovery Systems. T 17 CCR 94011 and incorporated certification	06/22/06	

Appendix Table A-7 Gasoline Vapor Recovery Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Vapor Recovery Aboveground Storage Tanks (AST). T 17, CCR, 94010, 94011, 94016 and 94168 and incorporated documents	06/21/07	
Gasoline Vapor Recovery System Equipment Defects List. T 17, CCR, 94006	N/A	

G. Other State Measures

A number of CARB measures do not fall into one of the categories of measures listed in Appendix Tables A-2 through A-7. These measures are listed below in Appendix Table A-8.

Appendix Table A-8 Other Not Previously Listed Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Airborne Air Toxic Measure for Ethylene Oxide from Sterilizers & Aerators. T 17, CCR, 93108	05/10/90	Covered by District Rule 7021. Emissions in category are less than 0.01 tpd VOC
Controls for Abrasive Blasting. T 17, CCR, 92000, 92200, 92400, 98500, 98510, 92520, 92530	11/08/90	Small source category in SJV < 0.1 tpd PM _{2.5}
Airborne Toxic Control Measure for Emission of Toxic Metals from Non-Ferrous Metal Melting. T 17 & 26, CCR, 93107	12/10/92	Adopted as District Rule 7060.
Air Toxic Control Measure for Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Facilities. T 17, CCR, 93111	04/27/00	Mainly addresses non-VOC
Airborne Toxic Control Measure for Asbestos from Construction, Grading, Quarrying, and Surface Mining. T 17, CCR, 93105	07/26/01	Controls equivalent to SJVAPCD Regulation VIII, approved 71 FR 8461 (2/17/06)

Appendix Table A-8 Other Not Previously Listed Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Air Toxic Control Measures for Auto and Mobile Equipment Refinishing Coatings Containing Hexavalent Chromium and Cadmium Compounds. T 17, CCR, 93112	09/20/01	Air toxic control measures prohibit additives with hexavalent chromium. Total emissions CA are less than 300 lb per year. ISOR, p. V-2.
Distributed Generation Guidelines and Regulations. T 17, CCR, 94200-94214	11/15/01	Minimal impact, few units certified. <i>See</i> ISOR for 9/28/06 rule amendment
Airborne Toxic Control Measure for Outdoor Residential Waste Burning. T 17, CCR, 93113	02/21/02	Regulated by Rules 4103 & 4106. Rule 4103 revised 5/17/07, approved 75 FR 74 FR 57907 (11/10/09). Rule 4106 (revised 6/21/01), approved 67 FR 8894 (2/27/02); additional revision in 2010.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines. T 17, CCR 93115 & documents incorporate by reference	2/26/04	PM control measure. NO _x regulated by Rule 4702. (approved 73 FR 1819 (1/10/08)). PM reductions are expected to be achieved primarily by replacement of existing engines as a result of District rule.
Airborne Toxic Control Measure for Hexavalent Chromium and Nickel from Thermal Spraying. T 17, CCR, 93102.5	12/09/04	Air toxic control measures. Total emissions (chromium & nickel in CA are less than 200 lb per year. ISOR, p. IV-6 to 8.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments). T 17, CCR, 93115	05/26/05/17/05	Revisions to 2/26/04 rule. PM control measure. NO _x regulated by Rule 4702. (approved 73 FR 1819 (1/10/08)). PM reductions are expected to be achieved primarily by replacement of existing engines as a result of District rule.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (amendments, In-Use Agricultural Eng. Exemption removal). T 17, CCR, 93115.1-93115.15.1.	11/16/06	PM control measure. NO _x regulated by Rule 4702. (approved 73 FR 1819 (1/10/08)) PM reductions are expected to be achieved primarily by replacement of existing engines as a result of District rule.

Appendix Table A-8 Other Not Previously Listed Measures Adopted by the California Air Resources Board 1990 to 2006		
Measure	Hearing Date	Comments
Distributed Generation Guidelines and Regulations. T 17, CCR, 94201, 94201.1, 94203, 94204, & 94207-942142	10/19/06	Addition of 2013 standards NO _x and VOC standards for DG units which burn waste gas.
Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations. T 17, CCR, 93102.1-93102.16	12/07/06	Air toxic control measures. Total emissions in CA are 14.4 lb per year. ISOR, p. 49.

Appendix B – SJVAPCD Rules

Appendix Table B -1
Status of San Joaquin Valley Air Pollution Control District Rules
June 16, 2011

Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4101	Visible Emissions	2/17/2005	2/17/2005	2/17/2005	70 FR 46770 (8/11/05)	Baseline measure
4103	Open Burning	4/15/2010	4/15/2010	4/15/2010 5/17/2007	NPR: 76 FR 40660 (7/11/11) 74 FR 57907 (11/10/09)	Control strategy measure.
4104	Reduction of Animal Matter	12/17/1992	12/17/1992	12/17/1992	75 FR 10691 (3/9/10)	Baseline measure
4105	Commercial Offsite Multi-User Hazardous and Non-Hazardous Waste Disposal Facilities	12/17/1992	N/A	N/A	N/A	Odor rule only
4106	Prescribed Burning	6/21/2001	6/21/2001	6/21/2001	67 FR 8894 (2/27/02)	Feasibility study completed in 2008. No additional rulemaking.
4201	Particulate matter concentrations	12/17/1992	12/17/1992	12/17/1992	67 FR 16026 (4/4/02)	Baseline measure
4202	Particulate matter emission rates	12/17/1992	12/17/1992	12/17/1992	65 FR 21347 (4/21/00)	Baseline measure
4203	Particulate Matter Emissions from Incineration of Combustible Refuse	12/17/1992	12/17/1992	N/A	no action	Baseline measure

<p>Appendix Table B -1</p> <p>Status of San Joaquin Valley Air Pollution Control District Rules</p> <p>June 16, 2011</p>						
Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4204	Cotton Gin	2/17/2005	2/17/2005	2/17/2005	71 FR 65740 (11/08/06)	Baseline measure Feasibility study measure, PM _{2.5} , (2009)
4301	Fuel Burning Equipment	12/17/1992	12/17/1992	12/17/1992	64 FR 26876 (5/18/1999)	Baseline measure
4302	Incinerator Burning	12/16/1993	12/16/1993	12/16/1993	64 FR 45170 (8/19/1999)	Baseline measure
4303	Orchard Heaters	12/16/1993	12/16/1993	12/16/1993	64 FR 45170 (8/19/1999)	Baseline measure
4304	Equipment Turning Procedures for Boilers, Steam Generators, and Process Heaters	10/19/1995	10/19/1995	10/19/1995	66 FR 5766 (11/16/01)	Baseline measure
4305	Boilers, Steam Generators, and Process Heaters - Phase 2	8/21/2003	8/21/2003	8/21/2003	69 FR 28061 (5/18/04)	Baseline measure
4306	Boilers, Steam Generators, and Process Heaters - Phase 3	10/16/2008	10/16/2008	10/16/2008	75 FR 1715 (1/13/10)	Control strategy measure
4307	Boilers, Steam Generators, and Process Heaters - 2.0 MM BTU/hr to 5.0 MMBTU/hr	5/19/2011	10/16/2008	10/16/2008	75 FR 1715 (1/13/10)	Control strategy measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4308	Boilers, Steam Generators, and Process Heaters - 0.75 MM BTU/hr to 2.0 MMBTU/hr	12/17/2009	12/17/2009	12/17/2009	76 FR 5276 (1/31/11)	Control strategy measure
4309	Dryers, Dehydrators and Ovens	12/15/2005	12/15/2005	12/15/2005	72 FR 29887 (5/30/07)	Baseline measure Feasibility study measure, PM _{2.5} & ozone (2011)
4311	Flares	6/18/2009	6/18/2009	NPR: 6/18/2009 6/20/2002	76 FR 52623 (8/23/11) 68 FR 8835 (2/26/03)	Control strategy measure.
4313	Lime Kilns	3/27/2003	3/27/2003	3/27/2003	68 FR 52510 (9/4/2003)	Baseline measure Feasibility study measure, PM _{2.5} & ozone (2011)
4320	Advanced Emission Reduction Option for Boilers	10/16/2008	10/16/2008	10/16/2008	76 FR 16696 (3/25/11)	Control strategy measures. No emissions reductions credit allowed.
4351	Boilers, Steam Generators, and Process Heaters - RACT	8/21/2003	8/21/2003	8/21/2003	69 FR 28061 (5/18/04)	Baseline measure

Appendix Table B -1 Status of San Joaquin Valley Air Pollution Control District Rules June 16, 2011						
Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4352	Solid Fuel Fired Boilers, Steam Generators, and Process Heaters	5/18/2006	5/18/2006	5/18/2006	75 FR 60623 (10/1/10)	Limited approval/disapproval S-COM-4 - Feasibility study measure, ozone & PM _{2.5} (2009)
4354	Glass Melting Furnaces	4/19/2011	9/16/2010	9/16/2010 8/17/2006	76 FR 37044, (6/24/11) 72 FR 41894 (8/01/07)	Control strategy measure.
4401	Steam-Enhanced Crude Oil Production Wells	6/16/2011	12/14/2006	12/14/2006	75 FR 3996 (1/26/10)	VOC measure Limited approval/disapproval
4402	Crude Oil Production Sumps	12/17/1992	12/17/1992	N/A	76 FR 298 (1/04/11)	VOC measure Limited approval/disapproval
4403	Components Serving Light Crude Oil or Gases at Light Crude Oil and Gas Production	4/20/2005	4/20/2005	4/20/2005	71 FR 14652 (3/23/06)	VOC measure
4404	Heavy Oil Test Station – Kern	12/17/1992	12/17/1992	12/17/1992	75 FR 10691 (3/9/10)	VOC measure

Appendix Table B -1 Status of San Joaquin Valley Air Pollution Control District Rules June 16, 2011						
Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4405	Oxides of Nitrogen Emissions from Existing Steam Generators (Central and Western Kern County)	12/17/1992	not submitted	N/A	N/A	
4406	Sulfur Compounds from Oilfield Steam Generators - Kern	12/17/1992	not submitted	N/A	N/A	
4407	In-situ Combustion Well Vents	5/19/1994	5/19/1994	5/19/1994	60 FR 12121 (3/6/95)	VOC controls
4408	Glycol Dehydration Systems	12/19/2002	12/19/2002	12/19/2002	68 FR 51187 (8/26/03)	
4409	Components at Light Crude Oil or Gases at Light Crude Oil and Gas Production	4/20/2005	4/20/2005	4/20/2005	71 FR 14653 (3/23/06)	VOC measure
4451	Valves, Pressure Relief Valves, Flanges, Threaded Connections and Process Drains at Petroleum Refineries and Chemical Plants	4/20/2005	4/20/2005	4/20/2005	71 FR 14652 (3/23/06)	VOC measure Rule incorporated into Rule 4455

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4452	Pump and Compressor Seals at Petroleum Refiners	4/20/2005	4/20/2005	4/20/2005	71 FR 14653 (3/23/06)	VOC measure Rule incorporated into Rule 4455
4453	Refinery Vacuum Producing Devices or Systems	12/19/1992	12/19/1992	N/A	73 FR 48 (1/02/08) withdrawn	VOC measure
4454	Refinery Process Turnaround	12/19/1992	12/19/1992	N/A	73 FR 48 (1/02/08) withdrawn	VOC measure
4455	Components at Refineries	4/20/2005	4/20/2005	4/20/2005	71 FR 14652 (3/23/06)	VOC measure
4501	Alternate Compliance for BARCT	6/17/1999	6/17/1999	N/A	no action	
4550	Conservation Management Practices	8/19/2004	8/19/2004	8/19/2004	71 FR 7683 (2/14/06)	Baseline measure Feasibility study measure, PM _{2.5} (2012)
4565	Biosolids, Animal Manure, and Poultry Litter Operations	3/15/2007	3/15/2007	N/A	no action	VOC measure
4566	Organic Waste	N/A	N/A	N/A	N/A	New rule for green waste.
4570	Confined Animal Facilities	10/21/2010	6/18/5/2009	6/18/2009	75 FR 2079 (1/14/10)	VOC measure Limited approval/disapproval.

<p>Appendix Table B -1</p> <p>Status of San Joaquin Valley Air Pollution Control District Rules</p> <p>June 16, 2011</p>						
Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4601	Architectural Coatings	12/17/2009	12/17/2009	12/17/2009 10/31/2001	NPR 76 FR 35167 (6/16/11) 69 FR 34 (1/02/04)	VOC measure Limited approval/disapproval - no sanction clock (disapproved elements expired)
4602	Motor Vehicle and Mobile Equipment Coating Operations	9/17/2009	9/17/2009	9/17/2009 12/20/2001	NPR: 76 FR 3214 (6/3/11) 67 FR 42999 (6/26/02)	VOC measure
4603	Surface Coating of Metal Parts and Products	9/17/2010	9/17/2010	9/17/2010 10/16/2008	NPR: 76 FR 3214 (6/3/11) 75 FR 4612 (1/19/10)	VOC measure
4604	Can and Coil Coating Operations	9/20/2007	9/20/2007	9/20/2007	75 FR 4612 (1/19/10)	VOC measure
4605	Aerospace Assembly and Component Coating	6/16/2011	9/20/2007	9/20/2007	75 FR 3996 (1/26/10)	VOC measure Limited approval/disapproval
4606	Wood Products Coating Operations	10/16/2008	10/16/2008	10/16/2008	74 FR 52894 (10/15/09)	VOC measure
4607	Graphic Arts	12/18/2008	12/18/2008	12/18/2008	74 FR 52894 (10/15/09)	VOC measure
4610	Glass Coating Operations	4/17/2003	4/17/2003	4/17/2003	69 FR 60962 (10/14/04)	VOC measure

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4612	Motor Vehicle and Mobile Equipment Coating Operations – Phase 2	10/21/2010	10/21/2010	9/20/2007	75 FR 4612 (1/19/10)	VOC measure
4621	Gasoline Transfer into Stationary Storage Containers	12/20/2007	12/20/2007	12/20/2007	74 FR 56120 (10/30/09)	VOC measure
4622	Gasoline Transfer into Motor Vehicles	12/20/2007	12/20/2007	12/20/2007	74 FR 56120 (10/30/09)	VOC measure
4623	Storage of Organic Liquids	5/19/2005	5/19/2005	5/19/2005	70 FR 53937 (9/13/05)	VOC measure
4624	Transfer of Organic Liquids	12/20/2007	12/20/2007	12/20/2007	74 FR 52894 (10/15/09)	VOC measure
4625	Wastewater Separators	12/17/1992	12/17/1992	N/A	73 FR 48 (1/02/08) withdrawn	VOC measure
4641	Cutback, Slow Cure, and Emulsified Asphalt Paving and Maintenance Operations	12/17/1992	12/17/1992	12/17/1992	75 FR 10691 (3/9/10)	VOC measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4642	Solid Waste Disposal Site	4/16/1998	4/16/1998	4/16/1998	66 FR 38939 (7/26/01)	VOC measure
4651	Soil Decontamination Operations	9/20/2007	9/20/2007	9/20/2007	74 FR 56120 (10/30/09)	VOC measure
4652	Coatings and Ink Manufacturing	12/17/1992	not submitted	N/A	N/A	No sources
4653	Adhesives	9/16/2010	9/16/2010	9/20/2007	74 FR 52894 (10/15/09)	VOC measure
4661	Organic Solvents	9/20/2007	9/20/2007	9/20/2007	75 FR 24406 (5/5/2010)	VOC measure
4662	Organic Solvent Degreasing Operations	9/20/2007	9/20/2007	9/20/2007	74 FR 37948 (7/30/09)	VOC measure
4663	Organic Solvent Cleaning, Storage, and Disposal	9/20/2007	9/20/2007	9/20/2007	74 FR 37948 (7/30/09)	VOC measure
4672	Petroleum Solvent Dry Cleaning Operations	12/17/1992	12/17/1992	12/17/1992	75 FR 10691 (3/9/10)	VOC measure
4681	Rubber Tire Manufacturing	12/16/1993	12/16/1993	12/16/1993	63 FR 43881 (8/17/98)	VOC measure

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Rule No.	Rule	Date of Most Recent Rule Adopted/ Revised	Date of Most Recent Rule Submitted	Date of Most Recent Rule Approved	Federal Register Cite	Comments
4682	Polystyrene, Polyethylene, and Polypropylene Products Manufacturing	9/20/2007	9/20/2007	1994	60 FR 31086 (6/13/95)	VOC measure
4684	Polyester Resin Operations	6/16/2011	9/17/2009	9/20/2007	75 FR 3996 (1/26/10)	VOC measure Limited approval/disapproval
4691 (461.02)	Vegetable Oil Processing Operations	12/17/1992	12/17/1992	12/17/1992	59 FR 2535 (1/18/94)	VOC measure
4692	Commercial Charbroiling	9/17/2009	9/17/2009	9/17/2009 3/21/2002	NPR: 76 FR 38340 (6/30/11) 68 FR 33005 (6/03/03)	Control strategy measure.
4693	Bakery Ovens	5/16/2002	5/16/2002	5/16/2002	69 FR 22441 (4/26/04)	VOC measure
4694	Wine Fermentation and Storage Tanks	12/15/2005	12/15/2005	N/A	no action	VOC measure
4695	Brandy and Wine Aging	9/17/2009	9/17/2009	9/17/2009	NPR: 76 FR 33181 (6/8/11)	VOC measure
4701	I/C Engines - Phase 1	8/21/2003	8/21/2003	8/21/2003	69 FR 28061 (5/18/04)	Baseline measure

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4702	I/C Engines - Phase 2	1/18/2007	1/18/2007	1/18/2007	73 FR 1819 (1/10/08)	Control strategy measure Scheduled adoption August 2011
4703	Stationary Gas Turbines	9/20/2007	9/20/2007	9/20/2007	74 FR 53888 (10/21/09)	Control strategy measure
4801	Sulfur Compounds	12/17/1992	12/17/1992	12/17/1992	no action	
4802	Sulfuric Acid Mist	12/17/1992	12/17/1992	12/17/1992	64 FR 30396 (6/08/99)	Baseline measure Limited approval/disapproval -No sanction clock
4901	Wood Burning Fireplaces and Wood Burning Heaters	10/16/2008	10/16/2008	10/16/2008	74 FR 57907 (11/10/09)	Control strategy measure
4902	Residential Water Heaters	3/19/2009	3/19/2009	3/19/2009	75 FR 24408 (5/5/10)	Control strategy measure
4905	Natural Gas-fired, fan-type, residential central furnaces	10/20/2005	10/20/2005	10/20/2005	72 FR 29886 (5/30/07)	Additional revisions scheduled for 2014 per PM _{2.5} plan commitment
8011	Fugitive Dust General Requirements	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures
8021	Construction, Demolition, Excavation, Extraction, and other Earthmoving Activities	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures

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8031	Bulk Materials	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures
8041	Carryout and Trackout	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures
8051	Open Areas	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures
8061	Paved and Unpaved Roads	8/19/2004	8/19/2004	8/19/2004	71 FR 8461 (2/17/06)	Baseline measures
8071	Unpaved Vehicle/ Equipment Traffic Areas	9/16/2004	9/16/2004	9/16/2004	71 FR 8461 (2/17/06)	Baseline measures
8081	Agricultural Sources	9/16/2004	9/16/2004	9/16/2004	71 FR 8461 (2/17/06)	Baseline measures
9310	School Bus	9/21/2006	9/21/2006	9/21/2006	75 FR 10420 (3/8/10)	Baseline measure
9410	Employer Based Trip Reduction	12/17/2009	12/17/2009	N/A	no action	Control strategy measure. Submitted May 17, 2010 (complete June 8, 2010)
9510	Indirect Source Review	12/15/2005	12/15/2005	12/15/2005	76 FR 26609 (5/9/11)	No emissions reduction credit allowed.